SUGAR y AZUCAR

JULY 1960

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persistent selective safe

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in the British Commonwealth (other than Australia) through Fisons Chemicals (Export) Ltd., 95, Wigmore Street, London W1, as **Simazine 50 W**

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SUGAR y AZUCAR

Volume 55 No. 7 July 1960

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COVER *With the accelerated trend toward mechanical harvesting this month's front cover sketch by Jack Brown may someday be a rarity. But today at least it typifies the harvest of more than 300 million tons of cane around the world.*

PORTADA *Con la creciente tendencia hacia la mecanización de la recolecta, la ilustración de portada de este mes, por Jack Brown, podrá llegar a ser una rareza. Pero hoy en día es típico de la recolecta de más de 300,000,000 de toneladas de caña en todo el mundo.*

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Editor, E. W. MAYO, JR.
Technical Editor, DR. O. W. WILLCOX
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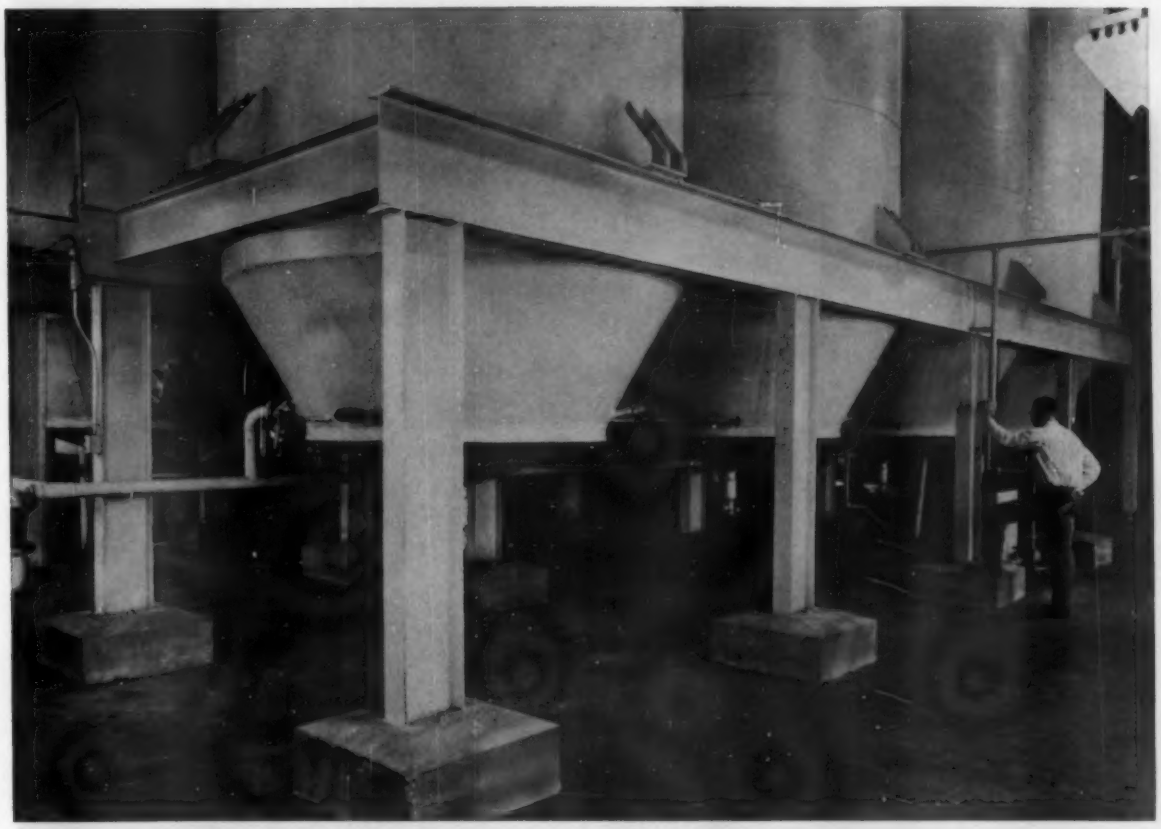

Southdown Reduces Cane Sugar Decolorizing Costs 75% with Pittsburgh Granular Activated Carbons

The Southdown, Inc. cane sugar refinery at Houma, La., recently completed the first full year's operation of its new granular carbon decolorizing plant. A comparison of cost records with the former counter-current system using powdered vegetable carbon indicates that the use of Pittsburgh Type CAL Granular Carbon significantly reduced decolorizing costs.

Southdown's new plant is an ideal example of a modern, clean and efficient decolorizing operation.

Each of eight cone-bottomed 9′ x 24′ filters holds a 35,000 lb. mixture of granular carbon and 7% by weight of dead-burned magnesite. On Louisiana raws, the filters run on 20 to 30 day cycles at a flow rate of approximately 33 gpm per filter. Average effluent is lighter in color than the liquor obtained with double filtration employing powdered carbon.

Granular carbon is moved hydraulically to and from the plant's reactivation kiln, which processes 13,000 lbs. of carbon per 24 hours, at a fuel cost of less than $6 per day.

Your refinery may be able to benefit from these same increases in decolorizing efficiency and reductions in costs. A Pittsburgh Technical Sales Representative will be glad to help you evaluate conversion to granular carbon in your plant. Call or write today!

Send For Complete Report

Write today for your free copy of the Southdown, Inc. study. Gives detailed information on filter operation, carbon handling and regeneration.

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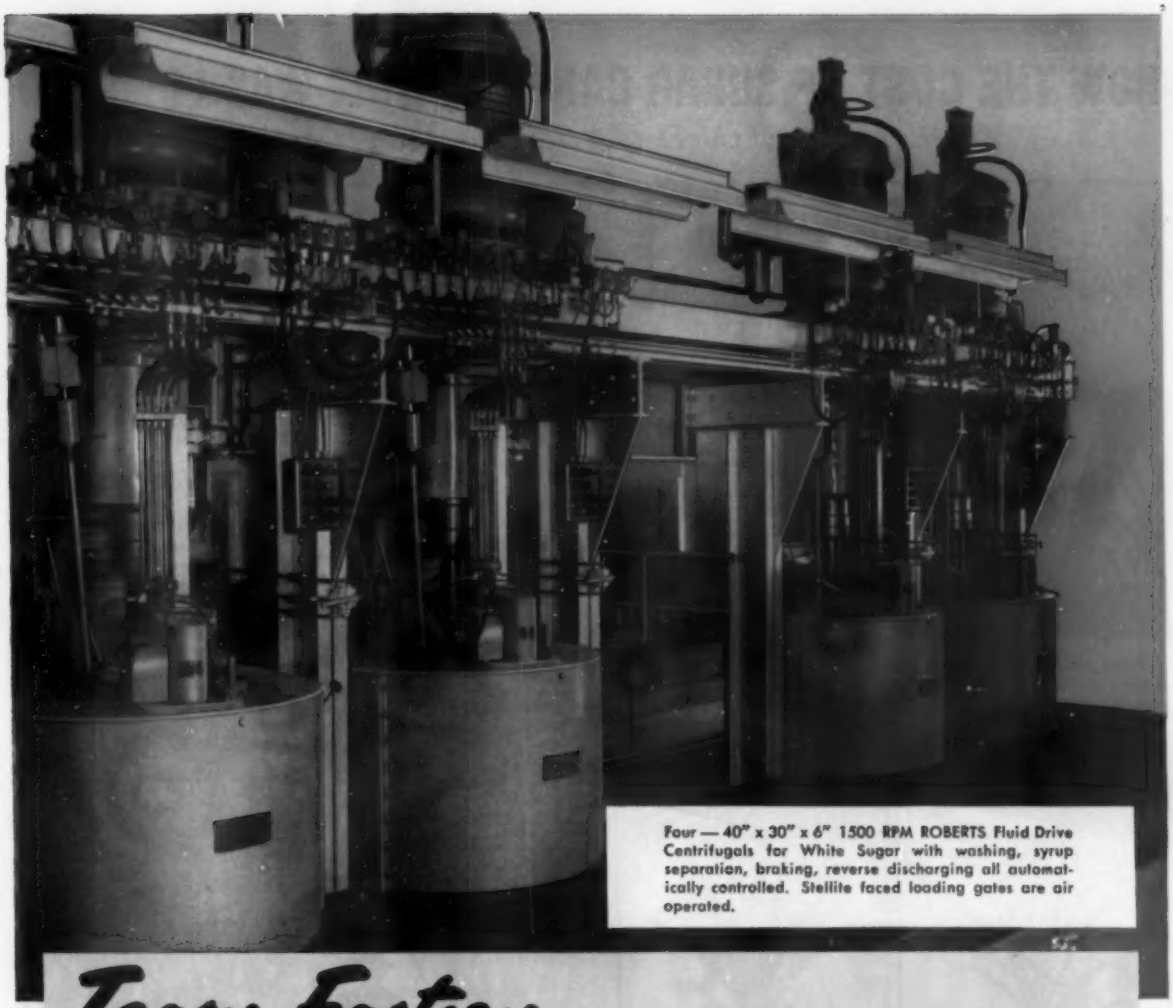

Four — 40" x 30" x 6" 1500 RPM ROBERTS Fluid Drive Centrifugals for White Sugar with washing, syrup separation, braking, reverse discharging all automatically controlled. Stellite faced loading gates are air operated.

Tracy Factory... HOLLY SUGAR CORPORATION

FOLLOWS PROFITABLE EXPERIENCE

IN 1948 a new factory at Carlton, California was built by Holly Sugar Corporation. Many novel equipments and processes were included. Of particular interest was the centrifugal station where the **FIRST** ROBERTS 40" x 30" Fluid Drives were installed.

NOW a new White Sugar Centrifugal Station at Tracy has been put into operation. **AGAIN** the machines are ROBERTS and again Fluid Drives with 40" x 30" baskets. **PROFITABLE EXPERIENCE** has confirmed the original selection and suggested **THE SAME BASIC MACHINES** plus the additional labor saving benefits of automatic reverse discharging with automatic basket valves.

2889

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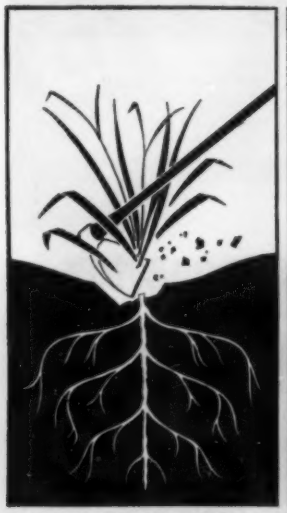
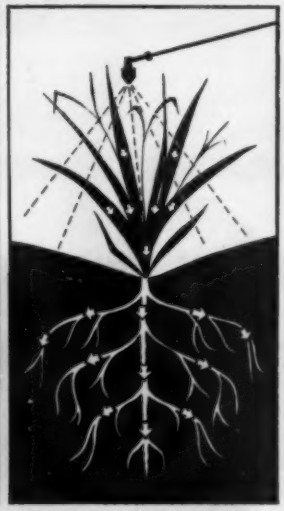
(with the help of the Dow Agricultural Representative)

A sugar cane planter was worried about the high cost of manual weed control. The weeds were robbing his plants of their food and moisture from the soil. Their control was robbing him of his profits.

His Dow Agricultural Representative told him he could lower his costs by controlling the weeds with Dow Chemical Weed Killers.

"To kill grasses use Dowpon*," he said," and for broad-leaf weeds, use 2-4 Dow Formula 40*. Both can be combined in a knapsack or tractor sprayer for easy and economical application. One application is sufficient."





"Cutting of weeds with a *machete* or hoe leaves the roots strong and healthy and the weeds re-sprout in a short time, but chemical weedkillers penetrate through the leaves reaching the deepest roots, killing the entire plant."

**Trademark of The Dow Chemical Company, U.S.A.*

The planter followed this advice. His sugar cane fields are clean and green; their yield has been increased; costs of weed control are lower. You too, can reduce your costs, visit the Dow Agricultural Representative or Dealer nearest you.

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Filtrate Clear as Clarifier Overflow!

Now — a new vacuum filter for cane mud makes it possible to obtain, by filtration, a sugar mud filtrate as clear as clarifier overflow! Filtrate from EimcoBelt filters now in operation can be sent directly to evaporators, without recycling to the clarifiers.

Filtrate clarities of less than 0.1% solids, by volume, have been obtained with EimcoBelt filters, average mud conditions. Sucrose loss is reduced because recycle retention time in the clarifiers is eliminated. Juice handling capacity of installed clarifiers is increased.

This important milestone in cane sugar processing is possible because the EimcoBelt filter can successfully remove the filter medium from the drum every filter cycle for cake discharge and cloth cleaning. The medium is scoured clean with wash sprays, front and back, before being returned to the drum. Closely-woven cloth or synthetic fabric media can be used — and maintained in a constantly unblinded condition.

The Eimco representative in your area can give you facts and figures on EimcoBelt filter performance in cane mud filtration — performance never before attained by any vacuum filter.

Write Eimco Filter Division for EIMCOBELT Bulletin F-2053

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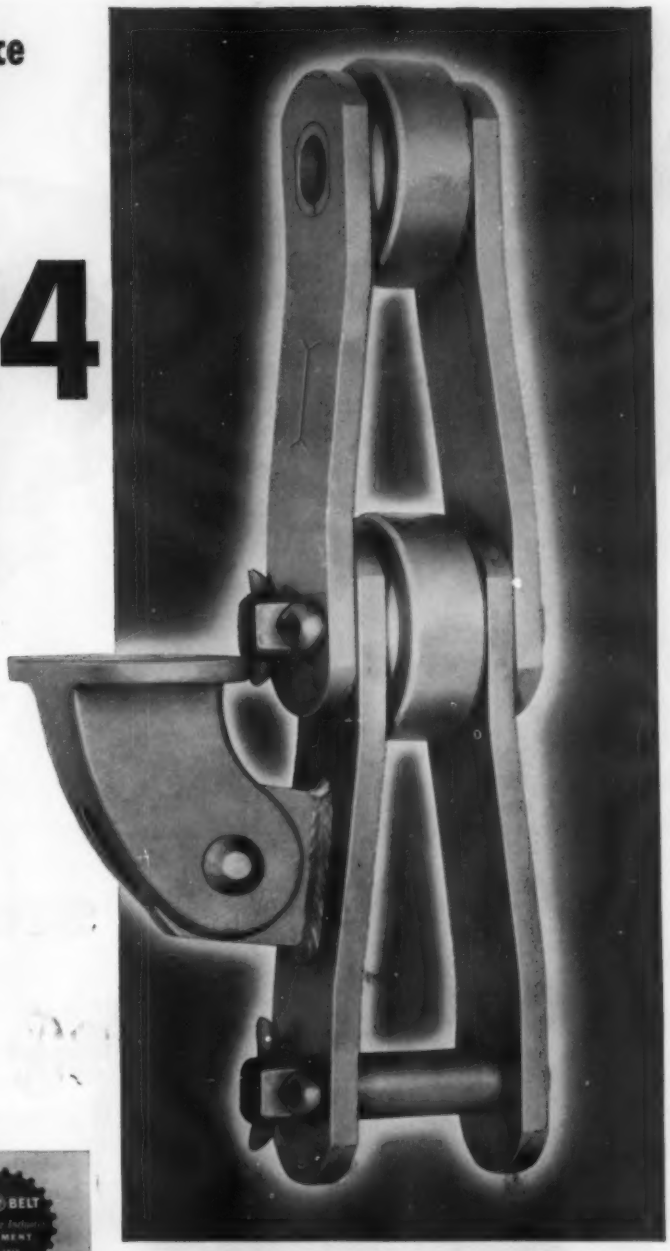

Exceptional strength and durability make Link-Belt SS-2184 Plus chain the choice for long, heavy-duty conveyors that reclaim and deliver bagasse to storage and boilers.

Use of selected steels plus controlled manufacture and assembly of parts result in increased life . . . reduced replacements and maintenance. When replacement becomes necessary, individual links with offset sidebars permit fast, easy removal.

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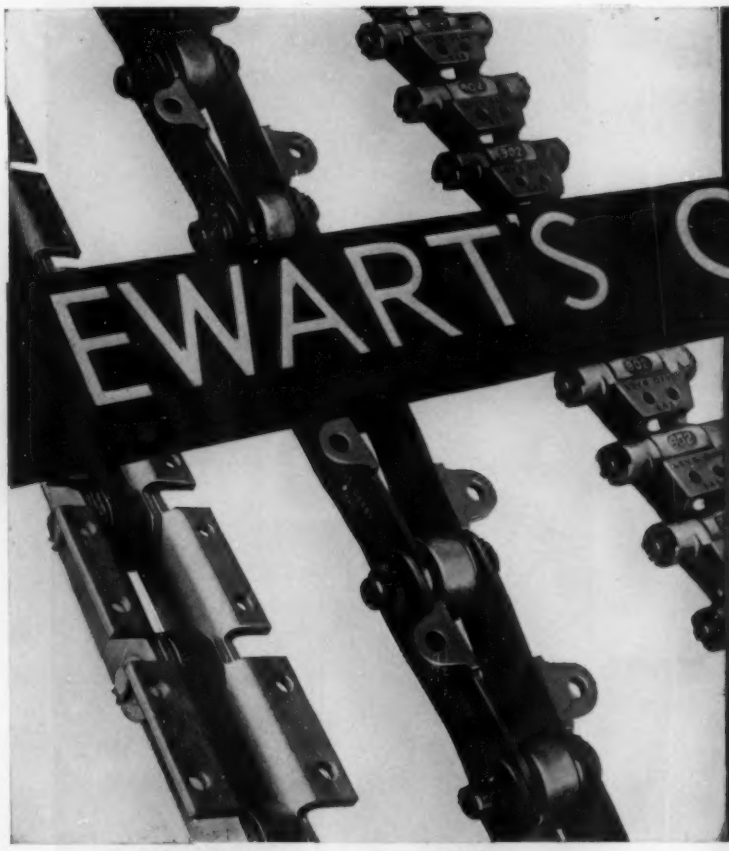

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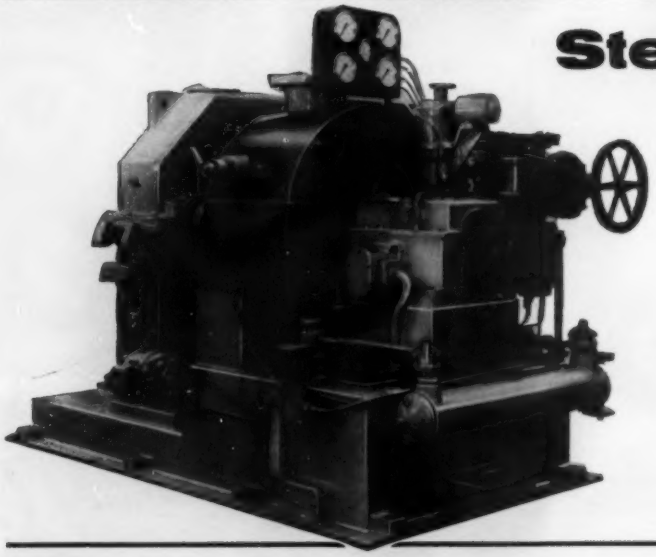

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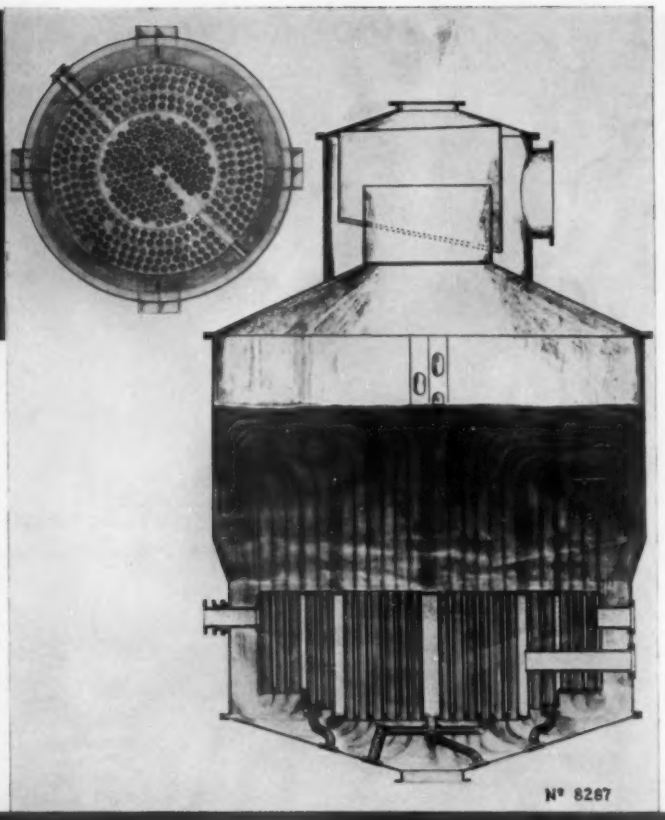

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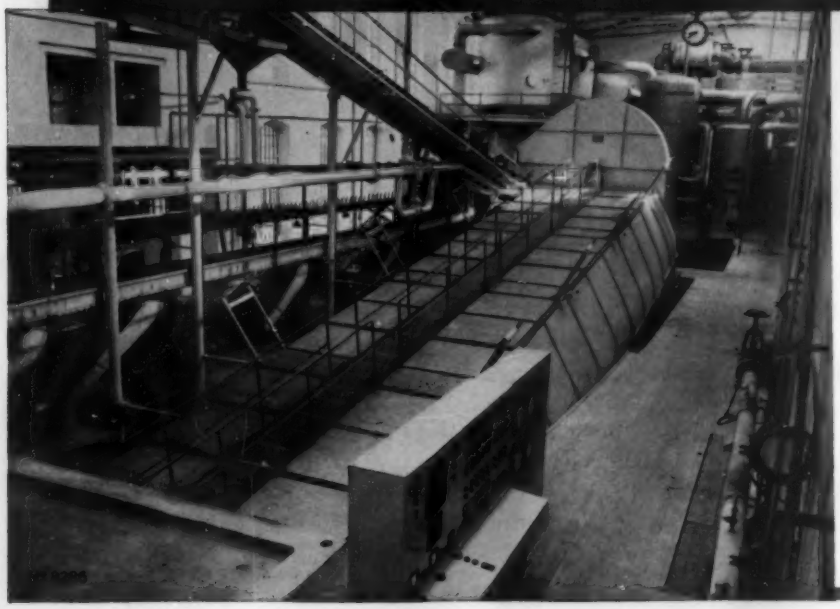

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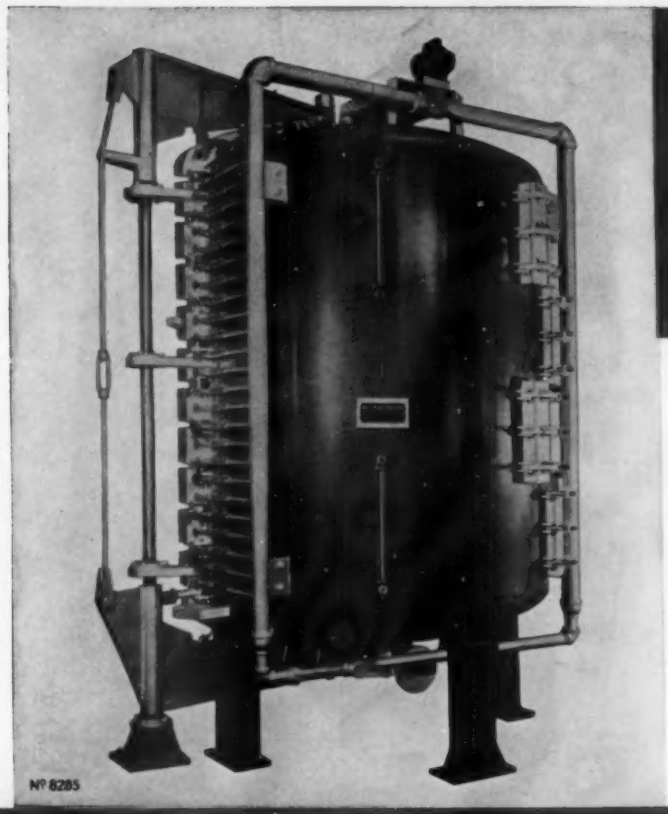

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In Raw Sugar Factories the filter can be applied to Cloudy filtrate or direct to Subsider Muds.

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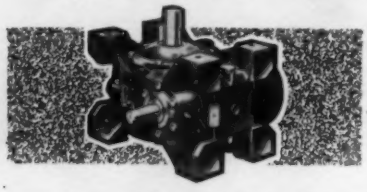

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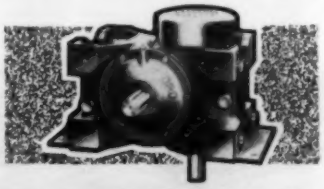

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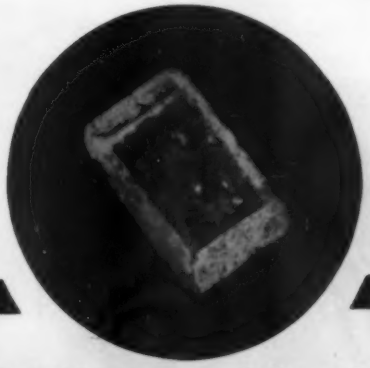

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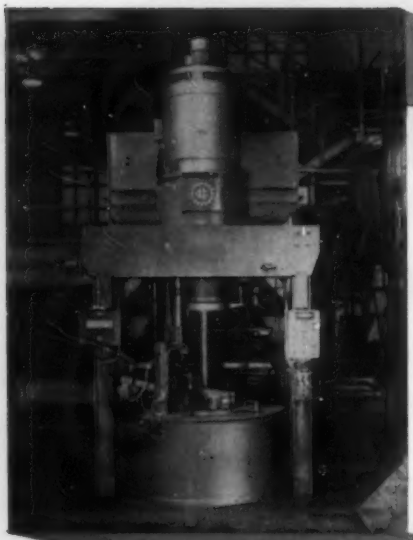

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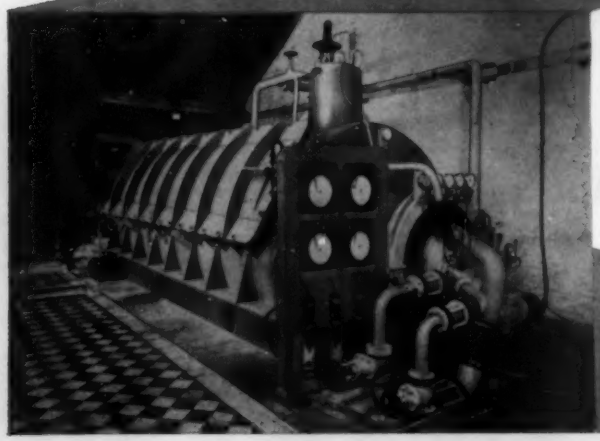

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JEFFREY CARRIER CHAIN

Jeffrey steel-thimble roller type chain; fitted for high pressure lubrication, if desired.

Developed especially for cane carrier service in large capacity sugar mills, this Jeffrey chain is available in five basic models—tensile strengths ranging from 47,000 to 125,000 pounds. Parts are made up in either medium high carbon or alloy steels, heat treated to assure maximum strength and wear resistance.

Cane carrier slats used with this type of chain are made available from Jeffrey in 10-gauge, 3/16" and 1/4" steel. They are available in four styles, hot formed to insure accurate and close fitting beads. Furnished in lengths of 24" to 106" in 6" increments.

Jeffrey Catalog 934 describes all types of sugar mill chain and carrier slats, as well as other sugar mill equipment – from delivery of the cane to shipment of the finished product. For a copy, write The Jeffrey Manufacturing Company, 916 North Fourth Street, Columbus 16, Ohio.

EXPORT DIVISION

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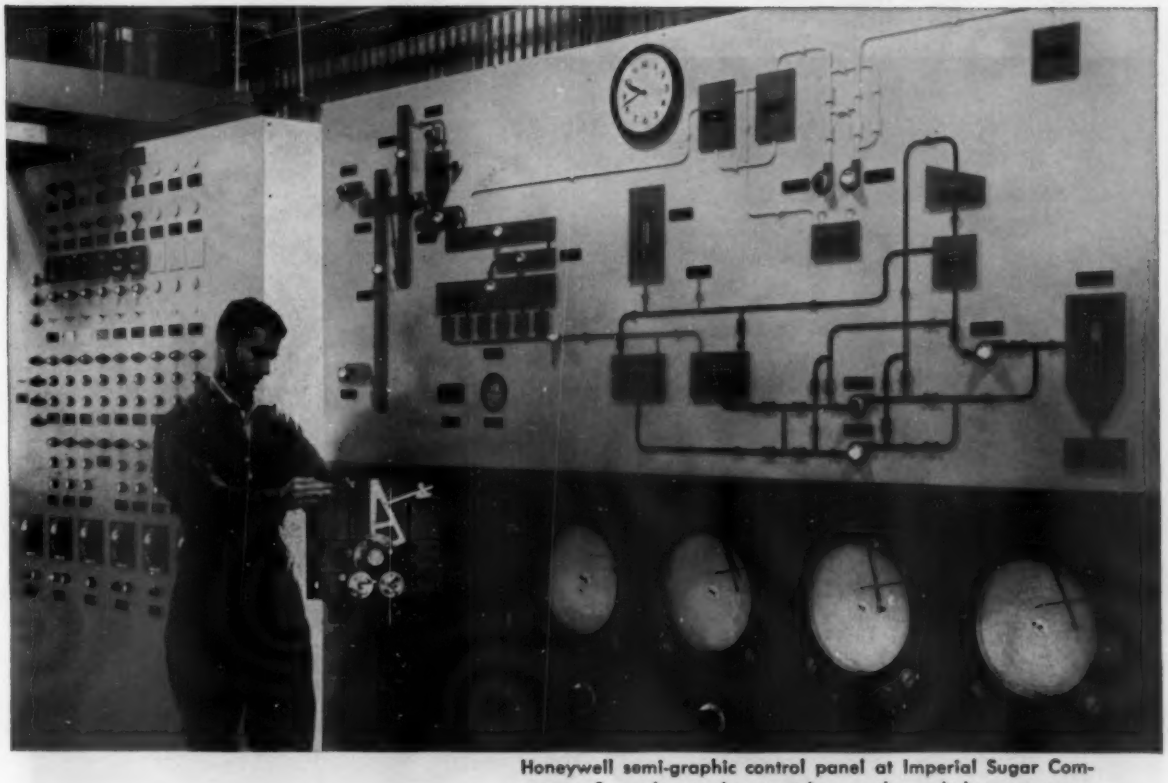

Honeywell semi-graphic control panel at Imperial Sugar Company refinery keeps close watch over the melt house process, helps set a new standard of efficiency in sugar refining methods.

Honeywell melt house controls help Imperial Sugar refinery increase capacity to 2,500,000 pounds a day...

Completion of a new melt house at Imperial Sugar Company's refinery in Sugar Land, Texas, marks the finish of a 12-year modernization program and the start of more profitable operations through automatic control. Honeywell instrumentation makes the melt house process a push-button operation from start to finish.

Automatic control of the mingling process is based on measurement of load on the mingler drive motor. Flow rate of the affination syrup, which is held at a constant temperature, to the mingler is adjusted to maintain motor load at a set value. This mingler control system produces a magma of uniform viscosity that results in better purging in the centrifugals. Cycle time in the centrifugals is adjusted between minimum and maximum points by the average level in blow-up supply and char house supply tanks.

A pre-set quantity of sweetwater is automatically added to the pre-melter scroll with each load of washed sugar as it is plowed from the centrifugal. Brix, temperature, and level are all controlled to the desired value by individual control loops. Level in the blow-up tanks following the melter is automatically controlled by adjusting the pumping speed of the screened liquor into the tank. A centrally located semi-graphic control panel gives the operator a clear, comprehensive picture of the entire process.

For help in gaining the advantages of instrumentation in any sugar process, contact your nearby Honeywell field engineer. Call him today . . . he's as near as your phone.

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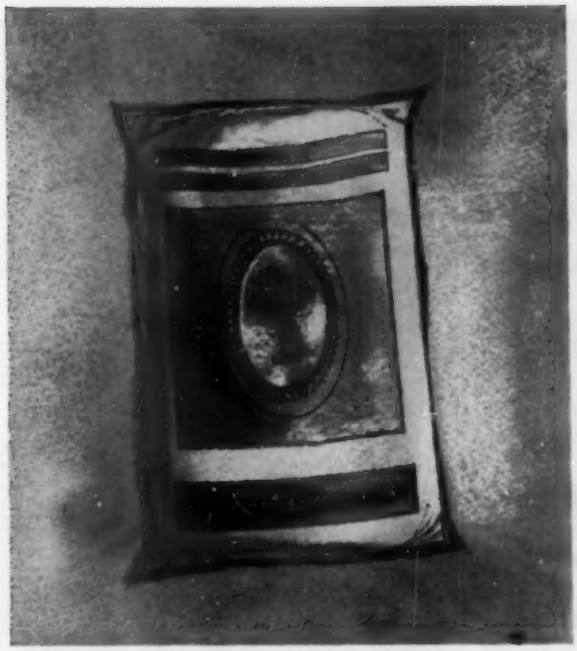

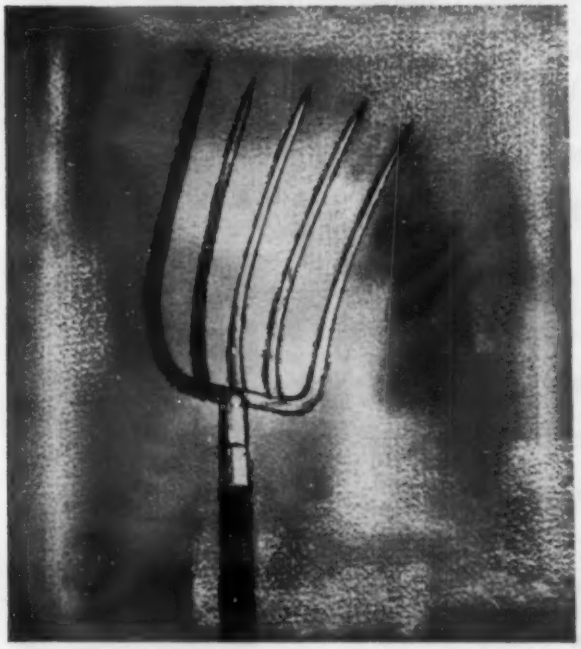

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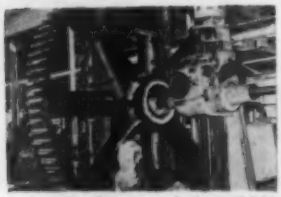
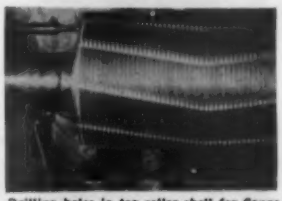


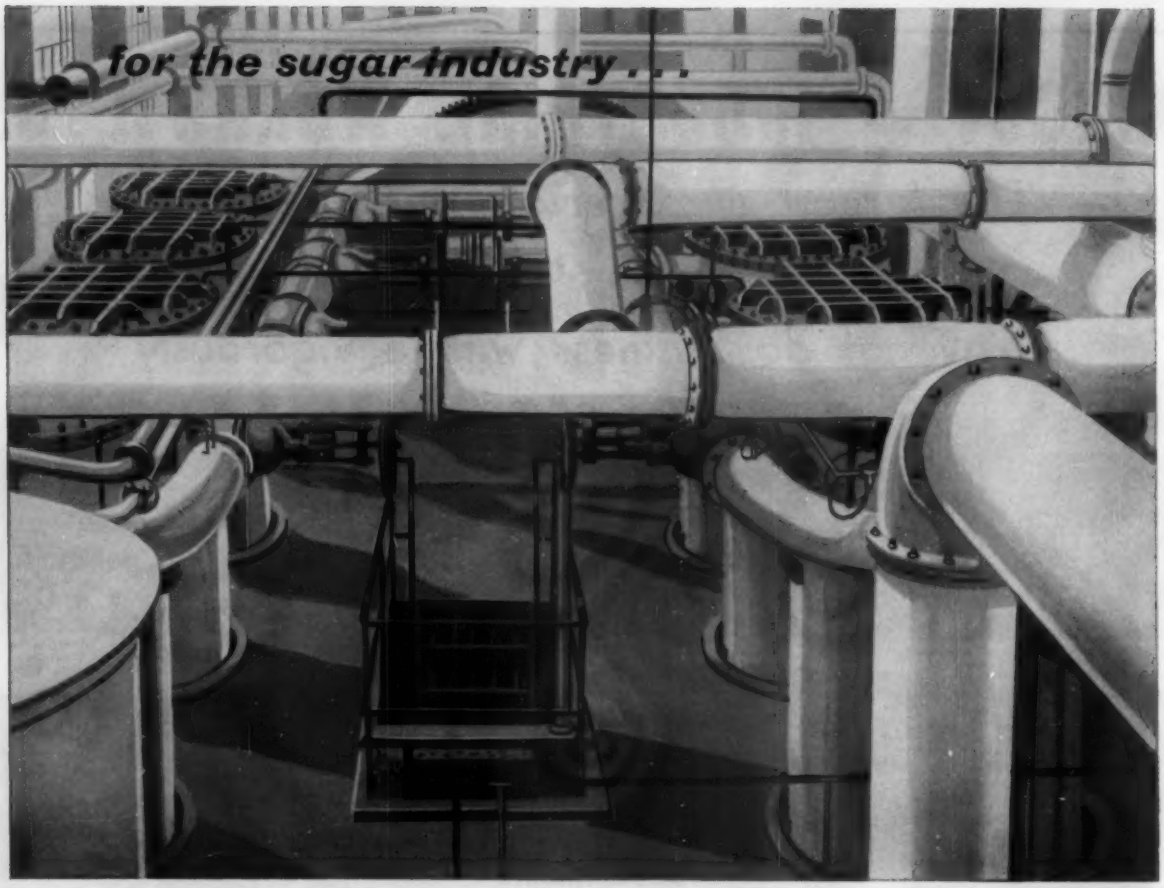
Boring 16' dia. gear wheel at K.I.W. machine shop for Bernard Lodge Sugar Mill, Ja.

Metal spraying worn shaft at K.I.W.

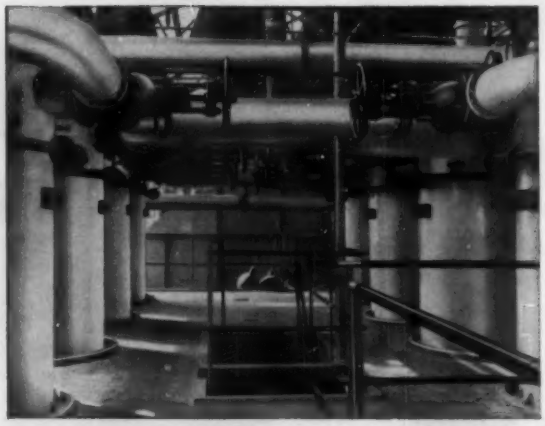


Drilling holes in top roller shell for flange bolts.

Partial view of plate shop showing — crystallizer trough, condenser and fuel tanks in production.



FLETCHER JUICE HEATERS



In these illustrations we show nine mild steel JUICE HEATERS which have been supplied to the British Sugar Corporation's factory at Ely. Each heater has a heating surface of 220 sq. metres and will work in conjunction with the largest R.T. Diffuser so far manufactured, which has a diameter of 6.75 metres. For some years now the Fletcher organisation has been supplying top quality machinery to both the beet and the cane industry at home and abroad.

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Advantages Of Mechanical Composting

Optimum Utilization Of Filter Press Muds

By Dr. William L. Owen

In a previous article (1) the author discussed the subject of composting filter press muds from cane factories, from the standpoint of the conditions that have to be maintained for the effective reduction of its organic matter into a plant food that would be immediately available for plant nutrition. To define composting in the sense in which we use the term, we might well quote from the work of Jann, Howard and Salle's publication (2) in which they define the term as follows: "Composting is the biological degradation of organic material which contains a variety of readily decomposable compounds into a relatively stable product or mass. A product or mass is produced which does not decompose or produce offensive odors as readily as the original material." As mentioned in our previous article, the essential conditions for rapid decomposition are 1st a capious supply of air throughout the mass, 2nd a maintained temperature of 55 C., 3rd maintenance of an optimum moisture content of 60 to 70% and the presence of an ample supply of vegetable matter. While organic crop or factory residues may decompose under both aerobic and anaerobic conditions, the aerobic conditions promote a more rapid decomposition, and at the same time there is developed a minimum of odoriferous intermediate products. In addition the pH of the material is as a rule lowered under the anaerobic fermentation while under the aerobic, a more desirable alkaline reaction is developed.

The question arises in this connection if all of these conditions for rapid composting may be maintained by a continuous system of mechanical handling. As mentioned in a previous article, there are several firms that specialize in manufacturing the equipment to produce finished compost from waste materials by a semicontinuous process. The writer on one occasion, through the cooperation of one of the Louisiana sugar companies, had several cubic feet of filter press mud and cane trash shipped to the Sanitary Disposal Corporation of Lansing, Michigan, for processing by mechanical means. The product produced under their conditions, and with their equipment, was found to be insufficiently decomposed and pot tests of the material indicated that the carbon-nitrogen ratio of the composted mud was still too wide to render the nitrogen of the material available for plant usage. This material was then placed in a large Buchner funnel and aerated daily for a period of two weeks, at which time the fibrous material had been reduced to a homogeneous consistency.

Jann, Howard and Salle (2) have studied the rate of composting progress of various raw materials at different temperatures, and their results are reported as follows:

Determination of Completion of Composting
(Determination of raw and composted stock yard manure with spent coffee grounds)

	Percentage or Ratio	
	Manure No. 1 20% Coffee	Manure No. 2 30% Coffee
Determination		
Carbon Raw	48.4	48.5
Carbon Composted	44.1	43.9
Nitrogen Raw	2.66	2.61
Nitrogen Composted	3.41	3.40
C : N Ratio Raw	18.6 : 1	18.6 : 1
C : N Composted	12.9 : 1	12.9 : 1

The above authors also composted stable manure with the results shown in the following table.

	Percentage or Ratio	
Determination	**Sample 1**	**Sample 2**
Carbon Raw	47.4	51.4
Carbon Composted	38.6	44.8
Nitrogen Raw	2.07	2.10
Nitrogen Composted	2.52	3.15
C : N Raw	23.1	24.1
C : N Composted	15.1	14.1

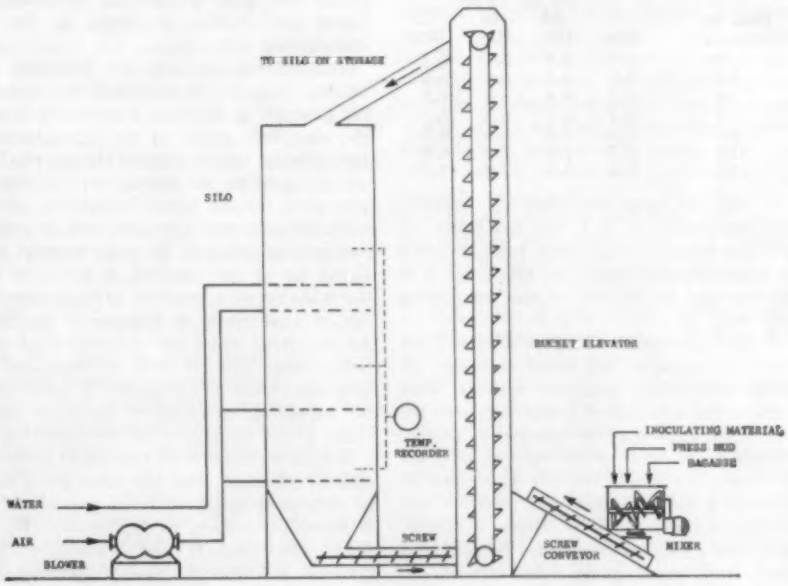
In comparison with the above sample of composted manure the composition of our finished filter press mud and bagasse compost was as follows:

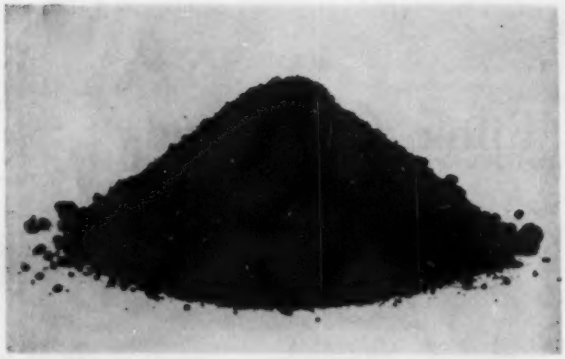
Carbon - 29.5
Nitrogen - 2.1

$$\text{Carbon : N Ratio} = \frac{29.5}{2.1} = 14.0$$

It will be noted that the final Carbon : N Ratio of our product had been reduced to approximately that of finished composted manure.

Jann, Howard and Salle (3) have also discovered that a test of the completion of composting is to subject the material at the completion of aerobic conditions over a considerable period, to anaerobic conditions under which, if the pH of the material does not drop, it may be regarded as completely decomposed. In Table No. 1 of their pub-





Mechanically compost D filter free mud

Winter grass on washed sand containing composting mud

lication they give the following data illustrative of this point.

Table 1
pH of Manure Held Anaerobically in Water at 55 C After Certain Intervals of Composting

Hrs. in Composter	pH in Tube 0 Hrs.	24 Hrs.	48 Hrs.	72 Hrs.
0	8.6	6.4	6.1	6.1
24	8.5	6.4	6.2	6.2
58	8.5	6.4	6.3	6.3
72	8.7	6.7	6.4	6.3
96	8.6	7.0	6.4	6.3
120	8.7	7.6	7.0	6.8
144	8.6	7.5	7.0	7.08

It will be seen that after the material was composted at 55 C for 144 hours the pH had begun to rise after being exposed to anaerobic conditions. So this point is to be regarded as the end of the composting period.

With mechanically composted filter press mud and bagasse, we found that the pH of the aerobically incubated material after leaving the mechanical composter, was 8.0 pH. After exposing this material to anaerobic conditions at a temperature of 55 C for 72 hours, we found the pH had risen to 8.4, which indicated that the material had become stabilized. It is apparent, therefore, that a stable compost can be prepared from fresh press muds even without dewaxing by subjecting it to maintained aerobic conditions. However, the undewaxed material is of a gummy consistency, and requires an admixture of some vegetable matter to render it sufficiently porous for the passage of air. A mechanical composter for filter press mud designed by Carter and Nansen is shown in the accompanying drawing.

This device provides the following facilities. Namely, 1 provision for turning the material at frequent intervals to insure the complete access of air throughout, 2 provision for the aeration of the material by air spargers on the interior of the silo, 3 provisions for the initial inoculation of the material with specially prepared microbial cultures propagated in a previously prepared lot of the compost, 4 provision for the addition of a coarsely ground constituent of cane trash or bagasse, 5 facilities for supplying water for moistening the material from time to time to maintain an optimum level of moisture, 6 provisions for supplying warm air to the mass especially at the beginning of the operation.

It is essential both for reasons of economy and for efficiency, that the filter press mud be processed as promptly as possible after it leaves the presses in the factory. By so doing, the moisture and warmth of the material is conserved and its fermentable material is made immediately available to the species of microorganism supplied by the inoculum used.

In this way, an impetus is given to those microbial activities that are essential for the production of the most desirable fertilizing material in the shortest possible time. Provisions for the supplying of warm air to the composting material in its initial stages of decomposition are also included in the facilities built into the mechanical composter. While the exothermic reaction of the composting process develops its own heat, it is preferable to hasten this reaction in its initial stages by the use of warm air. After the temperature of the mass begins to rise, the hot air supplied by the blower is switched over to air of atmospheric temperature levels.

There are two methods of determining the completion of the composting process, one is that previously described as developed by the authors previously referred to, which consists in the incubation of some of the material under anaerobic conditions, to determine if any foul odors are developed, and the other is, to determine if the temperature of the material has dropped to atmospheric temperature.

Of course the most revealing data are obtained from the determination of the carbon : nitrogen ratio in the material at different stages of composting, but this is a very long and tedious method, and even if the ash content of the material is used as a means of approximating the amount of carbon, this is a difficult procedure and its accuracy is greatly diminished by the difficulty of getting a uniform sample of the compost mass.

It might be asked if there are any advantages of mechanical composting of filter press muds from cane sugar factories, other than the saving of time, and the answer is that there are many, and most of them are more important than the time-saving element. For example, and as we have previously stated, the mechanical method makes immediate use of the constituents of the material, for the development of the most efficient species of microorganism for the degradation of the material. To windrow the material, we lose these advantages, as well as lengthen the time consumed, and also increase the labor expended in turning the material at repeated intervals. A third advantage is that the mechanically composted material, is immediately available to the planter, in contrast to that carried to the fields as at present and applied fresh and which remains ineffective over a long period of time, and tends initially to depress the available nitrogen in the soil. In addition to all of these, the immediate transfer of the wet muds from the filter presses to the closed composter eliminates the nuisance of the odor of the material which under those conditions decomposes anaerobically.

(*Continued on page* 49)

Sugar's Progress in

HUMAN RELATIONS

Roy J. Leffingwell

Distinctive Attributes Required of Sugar Managers

"My impression is that too many managers keep their noses so close to their own business that they never look up to see where they are going," a sugar executive wrote me. "Provide these people some guidance as to just what management is supposed to do."

This is a big order. However, the true story of a situation in another industry may help. The new sales manager of a large firm was in trouble. From the first month that he was appointed, sales started to drop. He was called on the carpet by his boss. The sales manager explained he was working 16 hours a day and personally calling on every prospect he could reach.

His boss told him curtly, "We can hire a man at half your salary to make sales calls. Around here we expect a manager to manage."

The sales executive replied, "But I've got to get out and do some work. I can't sit in the office and shuffle papers."

"I'm sorry," said the boss. "If management to you means paper shuffling, you won't succeed as a manager." A few days later the sales manager was fired. The reason—"weak manager."

Too many sugar managers, likewise, think of office work as nothing more than paper shuffling and want to get out in the factory and field and work. This is commendable—but as the sales manager was told, "we can hire a man for half your salary to (do this type of work)."

Leading, planning, organizing and controlling are activities that comprise the manager's job and these are the only activities by which he can be judged, as a manager.

There is no "one" way to manage. For example, the Cubans run their centrals on a completely different management principle than most Americans who operate sugar centrals in Cuba. (This is pre-Castro.)

I have been a guest in the home of a Cuban owner-manager during the grinding season. At all hours of the night there were raps at his door. Employes of the mill brought even the smallest problem to the personal attention of the manager.

In one case, the manager, his family and guests were aroused at 2:00 A.M. because a decision was needed to purchase an item which couldn't have cost more than 15 cents. But, no one had been delegated the authority to spend even this much money. This was the manager's exclusive right.

On the other hand, U.S. controlled mills in Cuba generally delegated authority to the shift foreman to carry on operations within certain established limits.

The Cuban system of management succeeds only because the grinding season is of a few months duration. Managers rest up for the ordeal and bravely carry through on a 24-hour basis for three or four months a year. However, if a manager should become seriously ill, the central might as well shut down—which it probably would.

Management cannot be conducted by a set of rules. The Cuban system works in a particular situation. It would fail in a majority of cases.

Furthermore, we can't say a manager should never get his hands dirty; however, it is safe to say if he does the job of a laborer or foreman very long, he is not successfully leading, planning, organizing, and controlling the activity.

Unfortunately, too many sugar managers have their noses so close to day-to-day routine problems that they can't plan for the future. This is management's great responsibility.

A bold experiment in labor-management relations was called for at the third All-India Labor Economic Conference, held recently in Madras. V. V. Giri, Governor of Uttar Pradesh, said that in the interest of industrial progress, labor problems should be kept out of party politics and discussed at an impartial academic level through non-partisan, non-political institutions. Pleading for a human approach in a welfare state, he added that—apart from political rivalries and multiplicity of trade unions—lack of education among workers and emphasis on external machinery for solving disputes, impeded the progress of democracy.

Imperial Sugar Co., at Sugar Land, Texas, continues this year a long-time policy of employing a limited number of local boys for summer jobs in the refinery. Jobs are open to students and graduates in the area surrounding the plant. Preference is given to sons, or close male relatives, of employes of the company.

The Hawaiian Commercial & Sugar Co., largest sugar plantation in the U.S., has taken two new steps in their apprenticeship training program. First, they have made it easier for those not presently connected with the company to join the program. The age limit has been raised from 18 to 25 years to 18 to 30 years.

A second change, gives selection priority to sons of plantation families, provided they pass the written examination and personal interview, given all applicants.

The Hawaiian sugar industry is continuing their program to bring in college graduates for intensive sugar training at the Experiment Station of the HSPA. Training includes formal classroom study at the Experiment Station and on-the-job instruction at sugar plantations.

Upon graduation, these men are almost always employed by Hawaiian plantations. In fact, there is usually a waiting line for new men coming out of this post-graduate course.

"Remember that committees are formed to interchange information, to collect information, to judge an idea or action, to advise another person or body, or to inform," comments an editorial in "Product Engineering" magazine.

". . . the committee conference is slow and costly. . . . However, it provides the advantages of group knowledge, providing it is an honest group with neither closed minds nor insufficient knowledge (pooled ignorance is still ignorance).

"The chairman is the order-keeper, he maintains discipline, keeps the discussion relevant, stops arguments, abuse, facetiousness.

"The successful chairman is a straight fast thinker, an easy and offhand speaker, capable of straightening out the language of the others to their satisfaction, a good analyst, fair, tactful and patient. . . . He must exercise control and proper direction through cooperation. . . . He should be able to ask questions that build the pooled information, that encourage the reticent member to speak up."

A shortage of cane cutters is in prospect for the coming harvest season in Australia. The sugar industry normally employs about 8,500 cane cutters. In addition, some 2,000 farmers assist in the harvest.

One district in Queensland, normally employing 1,000 cutters, has estimated that they will be more than 300 men short. Commonwealth Immigration authorities have been asked to make as many newly-arriving immigrants available as possible to the sugar industry.

A 36 inch belt carries raw sugar from the weighing house in background 1122 feet to the loading gantry at the rate of 700 tons per hour in Central Aguirre's modernized loading facility.

Aguirre Modernizes Bulk Loading Facilities

CENTRAL Aguirre Sugar Company—one of the largest producers of raw sugar in the Island of Puerto Rico—who pioneered conversion to bulk sugar handling in Puerto Rico shortly after World War II, has completed modernization of its facilities designed to increase greatly the capacity of its storage and shiploading operations. Central Aguirre now joins South Porto Rico Sugar Company at Guanica and the Central Coloso operated Aguadilla Terminal to give Puerto Rico three high capacity bulk sugar installations—all of which are engineered and equipped by Stephens-Adamson Mfg. Co., of Aurora, Illinois, in cooperation with the management and engineers of the operating companies.

The original Central Aguirre facility was brought about through the foresight and planning of Eugene Rice, president of that company, who made the conversion to bulk handling with a minimum of capital expense and use of existent facilities whenever possible. Sugar was loaded from the warehouse hoppers into 2½ ton capacity boxes in railroad cars which travelled on a siding underneath the warehouse. The boxes were then transported to the dock where the ship's cargo booms swung them over the ship's hold where they were dumped into a special Stephens-Adamson ship trimmer. The system, although an improvement over the past, had its inadequacies and a decided limit in loading capacity.

Stephens-Adamson Mfg. Co. was called in to design the recently completed high capacity system. The tracks under the warehouse silo were replaced with two 30 inch belt conveyors, each with a 350 ton per hour capacity and a speed of 400 feet per minute. The hydraulically actuated gates beneath the silo are controlled so they operate one at a time, feeding 300 tons per hour into a pair of traveling hoppers feeding each conveyor. The two 30 inch conveyors in turn feed a 36 inch belt conveyor with a 700 ton per hour capacity and belt speed of 600 feet per minute, which carries the sugar to a batch weighing house.

Sugar is transported from the weighing house to the ship loading gantry 1122 feet away on a 36 inch belt conveyor with a 700 ton per hour capacity and 600 feet per minute belt speed. At the permanent ship loading gantry a 60 foot boom conveyor feeds a telescoping chute at the bottom of which is mounted a 30 inch ship trimmer. The boom can be swung over a 70 degree arc and the chute raised and lowered permitting the ship trimmer (a centrifugal thrown unit) to load more than one hatch without moving the ship.

Whereas ships previously took two to three days to be loaded, under the new high capacity system ships can be in and out of the Central Aguirre port in less than 24 hours.

A feature of the conveyor installations is the design of the stringers and decking. One-piece bent plate combination stringer and decking is used throughout. This con-

struction gives a clean and streamlined appearance and offers a minimum of surface irregularities. Maximum corrosion resistance and wash down operations essential to good housekeeping in sugar operations is simplified. The design of the gates and travelling hopper arrangement provide delivery of maximum capacity without danger of flooding the belt. The special design of the transfer points assures centered loading and a minimum of spillage.

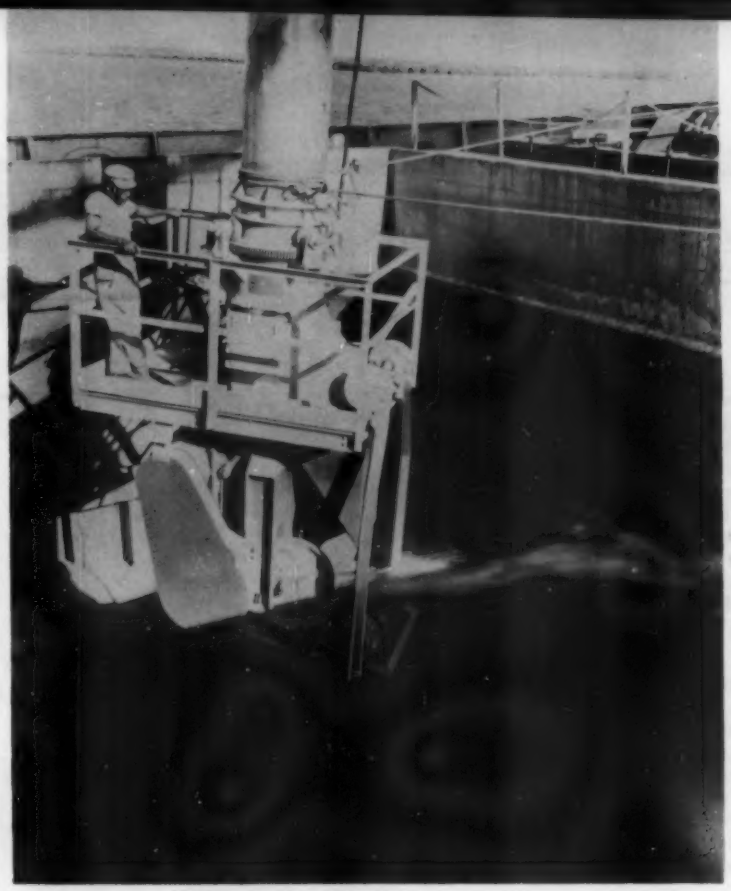
The batch weighing system is extremely accurate and dependable and incorporates hopper-type scales originally developed for the Aguadilla installation and proved highly successful there. The hydraulically operated hopper-gates were also specially engineered for high capacity systems.

The pivoted boom conveyor—which can be raised or lowered to suit conditions of the ship in water—provides a maximum of flexibility to accommodate the various types of ships expected at the port. In the stowed position the boom is locked in a special cradle which relieves the load on the hoisting and swinging machinery.

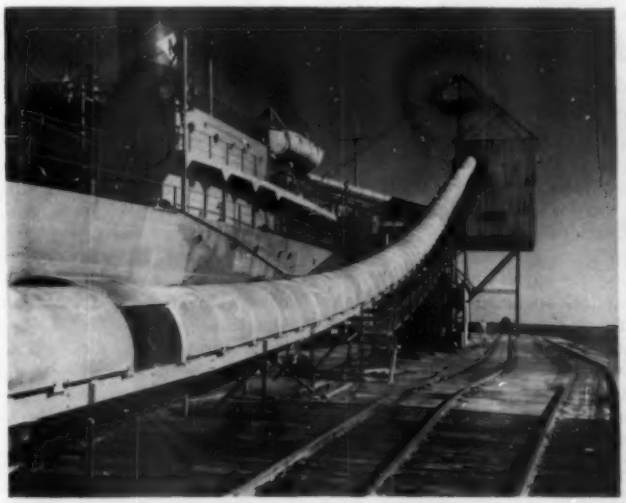
The ship trimmer mounted at the lower end of the telescoping chute features the centrifugal throwing principle. Sugar falls through the spout and onto a short endless rubber belt which operates at high speed over pulleys and idler discs. In the short distance material travels on the belt, it directs the flow of sugar to the far corners of the hold, insuring an efficiently trimmed cargo. Due to the fact that raw sugar is virtually dustless, it was possible to locate the operator's platform on the trimmer itself, enabling him to exercise control over the trimming operation from close range.

The electrical push-button station for the telescoping chute hoist is located on this platform. Swivel control is manual by means of a ratchet lever and gear and pinion set. Trajectory control is manual by a handwheel. Other features of the chute and trimmer include; chute of stainless steel construction, trimmer body of corten steel, bronze swiveling gear and pinion, self-aligning feature on belt to improve belt training and readily removable endless belt.

The installation utilizes Stephens-Adamson equipment throughout, including carriers, holdbacks, belt cleaners, and the new S-A curve crown pulley which provides greater belt training effect with a minimum of belt wear.



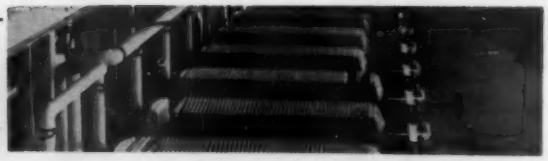
At the bottom of the telescoping chute a Stephens-Adamson ship trimmer operating on the centrifugal throwing principle directs the flow of raw sugar to all corners of the hold efficiently trimming the cargo.



The covered conveyor belt brings the raw sugar alongside the ship which can be loaded in less than 24 hours contrasted with the three to four days formerly required.

The 60 foot boom conveyor swings over the ship's loading hatches into which the telescoping chute is lowered. Boom swings over a 70 degree arc; chute can be raised and lowered to accommodate various types of sugar vessel.

Personal press station



• At a meeting of Imperial Sugar Company's employees at Sugar Land, May 28th, 1960, **W. H. Louviere,** president of the company, received two of the nation's top awards for Imperial's 1959 industrial safety record. The company experienced only one lost-time accident during 1959, and its 600 employees worked more than 1,000,000 man-hours consecutively without a lost-time accident during the year.

• A prominent soil scientist, **Dr. George Stanford,** will join the staff of the Experiment Station of the Hawaiian Sugar Planters' Ass'n. on July 1, 1960 as principal agronomist. He succeeds **Dr. Roger P. Humbert** who resigned from the Station at the end of last year to become Western Director of the American Potash Institute in San Jose, Calif.

• A Vice President of California & Hawaiian Sugar Refining Corp., **George W. Aljian,** has retired after 41 years of service. He has held positions as purchasing agent and director of purchasing and packaging with this sugar firm. In 1951, Mr. Aljian was also named Coordinator of the By-Products Project of the Hawaiian Sugar Planters' Association of Honolulu. On retiring from C & H he will continue this assignment, completing studies on the potential commercialization of the use of sugarcane bagasse for producing pulp and paper.

Geo. W. Aljian

• **C. Cadagan,** recently named vice-president and general manager of Alexander & Baldwin, Ltd., one of Hawaii's sugar agencies, has been elected to the Executive committee of the Hawaiian Sugar Planters' Association.

Felix M. Ginorio, Jr.

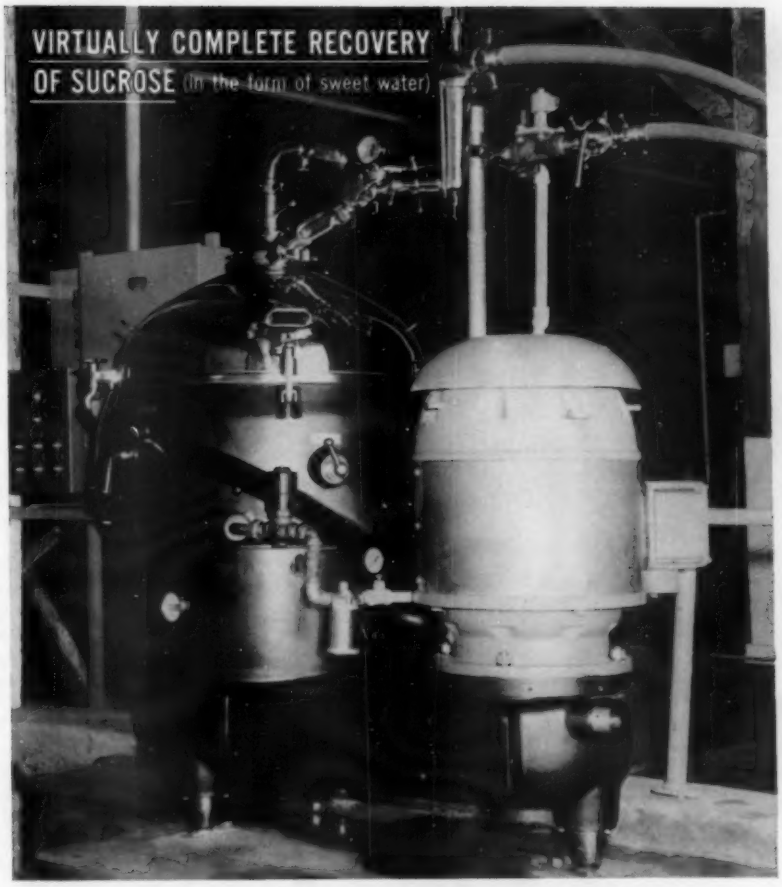
• Barrington International, Inc., management consultants have elected **Felix M. Ginorio, Jr.** as vice-president. He was formerly Director of the Mainland Offices of the Puerto Rico Development Administration and joined Barrington in 1958. Mr. Ginorio was responsible for early work in the application of practical standards and incentives to cane cutting. Long convinced of the potential benefit to be derived by the sugar industry from increased use of industrial engineering and management principles proven in other industries, he has worked successfully with sugar producers in the U.S., Puerto Rico, Dominican Republic and Cuba.

• **Eugene C. Gillett,** well known sugar technologist and chemical engineer has been appointed Technical Advisor to the Vice President—Operations of California & Hawaiian Sugar Refining Corp., San Francisco, Calif. Most recently Mr. Gillett has been Production Manager of the C and H Crockett Refinery which is the world's largest sugar refinery. Previously he has held several professional and supervisory positions during his 40 years' association with C and H. He is recognized throughout the food industry for his achievement and writings in the field of sugar technology.

Eugene C. Gillett

• **James F. Zievers** was elected President of the Foreign Sales Division, Inc. of Industrial Filter & Pump Mfg. Co., Cicero, Ill. He is Vice President and General Sales Manager of the parent company and has served in various sales and executive capacities during the past ten years.

• **H. A. Walker, Sr.** retired as chairman of the board of American Factors, Ltd. in Honolulu. He started his career in the Hawaiian sugar industry 41 years ago, when he was employed as manager of the labor department of the Hawaiian Sugar Planters' Association. In 1928 he left HSPA to become manager of the plantation division of American Factors. Mr. Walker then moved up to the presidency of HSPA. He has long been active in management direction of the California & Hawaiian Sugar Refining Corp. of San Francisco. He is one of the best known Hawaiian sugar men and an outstanding civic leader in the Islands.



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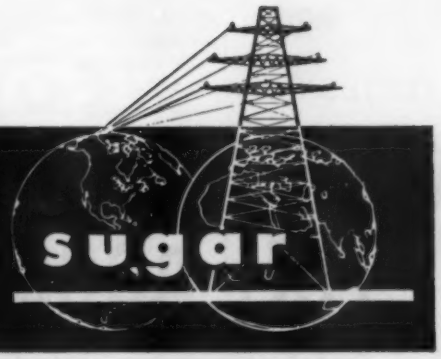

NEW YORK, JUNE 3, 1960: Chairman Cooley (Dem., N.C.) had his bill reported out of the House Agriculture Committee on June 1st. This bill would extend the Sugar Act for one year in its present form, but would change the wording of Section 204(c) so that when deficits are declared by the Secretary of Agriculture they cannot be filled later in the year by that deficit area, as permitted now. Although many informed observers believe that the Cooley bill has a good chance of being passed, B. W. Dyer & Company, Sugar Economists & Brokers, report that there is considerable opposition.

Robert C. Hill, U. S. Ambassador to Mexico, spoke at the annual Sugar Club dinner in New York on June 2nd. Prior to his speech, he called on Senator Bennett (R. Utah) to read a letter received the previous day from President Eisenhower, which called for prompt action on the sugar legislation recommended by the Administration earlier this year. This legislation would extend the Act four years and give the President power to cut foreign quotas. It also would raise the basic quotas of the mainland cane and beet areas by 50,000 and 150,000 tons, respectively, in exchange for giving up their share of of Puerto Rican deficit prorations to Cuba and full duty countries.

While the latter provision apparently is designed to overcome the inadequacy of Puerto Rican deficit prorations in the Northeast, it probably will not help this condition until at least 1962. However, in subsequent years it should help offset the deficit somewhat. On the other hand, if the introduction of the new high-yielding cane variety "Puerto Rico-1013" should succeed in overcoming future deficits, there apparently will be less cane sugar quota available in the Northeast under the Administration formula than under the present Sugar Act.

Refined sugar distribution to May 28th this year was 121,000 tons behind that of last year. However, the impetus of a refined sugar price advance in May 1959 stimulated deliveries in that month. June deliveries probably will exceed those of last year, but it is doubtful that the increase will be sufficiently large for the cumulative figure to catch up with that of 1959.

Refined sugar prices in the Chicago-West territory reverted to the basing point system on June 1st, which indicated an increase in the cost of sugar delivered at most destinations. However, Northeastern refiners extended their price reductions on bulk dry and liquid sugar through June 30th on a day-to-day basis.

Domestic (#6) spot raw sugar prices declined from $5.65 per 100 pounds at the beginning of May to $5.55 on May 12th, as unsold cargoes got into distressed positions in Northeastern ports.

World (#4) spot prices advanced to 3.08¢ per pound on May 20th, but then declined, and were 3.01¢ on June 3rd.

The International Sugar Council announced that on May 25th, 118,285 short tons of shortfalls were redistributed. Cuba received 64,701 short tons of this redistribution, boosting its quota to 2,922,424 short tons.

Cuban sales to the world market (outside U.S.) through May 31st totaled 2,617,872 short tons, according to a survey by Willett & Gray, Inc., compared with 961,298 short tons in that period last year. Thus, it appears that Cuba may soon fill its world quota, B. W. Dyer & Company concludes.

Sugar Prices—June 3, 1960

Ex. Duty Raw Sugar N.Y.	**5.55**
Average #6 Raw Sugar Jan. 1 to June 3	**5.55**
Refined Sugar Gross N.Y.	**9.20**
#4 Raw Sugar (f.o.b.) Cuba	**3.01**
Average #4 Sugar Jan. 1 to June 3	**3.03**

Future Prices	*Contract #6*	*Contract #4*	*Contract #7*
July 1960	**5.80**	**3.01**	**6.41**
Sept. 1960	**5.95**	**3.12**	**6.46**
Oct. 1960	...	**3.15**	...
Nov. 1960	**5.99**	**3.28**	...

Incentive Payments in Puerto Rico

SAN JUAN, MAY 31, 1960: The legislature of Puerto Rico has approved a law appropriating $1,400,000 to be used as incentive payments to farmers who make new plantings of cane during 1960. The law also authorizes the use of $2,800,000 to be used in the same manner during the next two years beginning 1961. The incentive payments are at the rate of $50 for each acre planted with varieties approved by the Department of Agriculture.

The Agricultural Experiment Station of Puerto Rico has issued its miscellaneous Publication No. 30 entitled "Progress and Accomplishments in Research on Sugar Cane". The book also describes a number of projects now under way at the Station.

The Agricultural Experiment Station of the University of Puerto Rico is getting ready to celebrate its 50th anniversary. The festivities will begin during the month of August and will include a program to commemorate the events of half a century of agricultural investigation.

Up to May 22 the twenty-nine sugar Centrals of Puerto Rico have processed a total of 8,483,765 tons of cane and have produced 870,700 tons of sugar with a yield of 10.263%. Excessive rains during the months of April and May seriously inconvenienced harvesting operations and considerably reduced the output of sugar. Some of the Centrals are facing the prospect of having to stop grinding if the sugar yield continues to decline to a point where normal grinding cannot be maintained.

The Aguirre Sugar Co., in cooperation with scientists from the well known packing firm of Libby & Co. are conducting a series of experiments to determine the possibilities of rotating tomatoes in the cultivation of sugar cane, and up to date the prospects seem to be very attractive. If these prospects are realized the Libby Co. is prepared to erect a plant for canning tomato puree and tomato juice, and possibly other tropical fruits.

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ana, in cooperation with the Agricultural Experiment Station of the University of Puerto Rico and the Association of Sugar Producers is building a new sugar cane harvester; this machine will be ready for testing during the present year. The Cary Machine for cutting and loading cane has been under test in various regions of the Island, but as yet no definite recommendations for its use have been made.

The exchange of goods between Puerto Rico and the United States reached a new high in 1959. Puerto Rico's purchases from the United States amounted to $719,000,000, while the United States bought $559,000,000 worth of Puerto Rico products. Only six countries: Canada, the United Kingdom, Japan, West Germany, Mexico and Venezuela are better customers of the United States than Puerto Rico.

Tidal Wave Damages Hawaiian Installations

HONOLULU, MAY 31, 1960: Hawaii suffered loss of life and serious damage in a tidal (tsunami) wave, which resulted from earthquakes in Chile, on the morning of May 23rd. In many respects, the damage was more extensive in Hilo, Hawaii, than caused by the tidal wave of 1946, although loss of life was not as great.

The Hawaiian sugar plantations, many of which suffered severe damage in 1946, were all spared this year. There was some loss at bulk sugar plants located at Hilo, Hawaii and Kahului, Maui. Most of this was due to flooding of machinery on ground floor levels.

The Hilo bulk plant is built near the site of a bag sugar pier which was totally destroyed in 1946. Design of the Hilo bulk sugar installation with four big metal silos, instead of the more conventional warehouse, was specifically to prevent destruction from tidal wave action. This was the first full test of this design—and apparently it proved to be sound.

Hawaii's mills on two islands put bulk raws into temporary storage for a few days until electric power could be restored and the ground floor machinery cleaned-up. However, the plantations did not shut down.

Hilo Iron Works (a subsidiary of Honolulu Iron Works) was almost completely wiped out. A 25-ton crane was picked up by the force of the water and dumped into a nearby river.

Hilo Trailer, Ltd., manufacturers of 80% of all the new cane hauling equipment in Hawaii, was badly flooded.

Another cane harvester—the 29th by number—is being field tested this month by the Hawaiian sugar industry. The newest machine was designed by R. A. Duncan, chief engineer of the Experiment Station, Hawaiian Sugar Planters' Ass'n. It will cut cane, pick it up, chop it into 18-inch lengths and convey pieces to a trailer which is pulled alongside by an infield prime mover. The machine is said to embody a combination of earlier harvesters and several revolutionary changes. It is lighter and less expensive to build than previous Hawaiian units.

Six C. Brewer & Co. plantations on the Island of Hawaii and Puna Sugar Co. asked for increases in present rates for processing cane for independent growers. This action was taken at the annual hearing held by the U.S. Department of Agriculture to fix fair and reasonable cane prices, under provisions of the Sugar Act.

Brewer plantations asked for a hike from 45% to 48¼% for processing. Puna Sugar Co. asked either for a raise from 36% to 38%, or an increase in profit on services from 5% to 10%.

Kohala and Laupahoehoe sugar companies indicated a willingness to continue their 1959 rates of 22% and 45%, respectively.

The percentage which the mills get depends to a large degree on where cane delivery is accepted by the mill. Therefore, the percentages are not comparable.

A bulk bin trailer has been developed for airplane fertilizing by Hawaiian Agricultural Co. The trailer has four individual bins which load into a fingerlift that has a large hopper mounted on the lift forks. The hopper is raised to allow a gravity flow of fertilizer into the airplane fertilizer compartment.

Hutchinson Sugar Co. has built a new air strip at 3,000 foot elevation. This replaces a strip at 1,500 foot elevation. Operating from the higher level requires less time for the plane to climb. With a full load, climbing time is an important factor. Especially, is this true now that the sugar company is planting cane above the 3,000 foot level.

Orders have been received by Hilo Trailer, Ltd. for air-hydraulic landing gears for cane hauling semi-trailers from two Hawaiian sugar plantations. Hilo developed the new landing gear which also has an automatic disconnect operated by the driver from inside his truck cab. The first installation was at Laupahoehoe Sugar Co. on the Island of Hawaii. It is estimated that by disconnecting semi-trailers from road prime movers, and using field power units, it is possible to reduce the number of prime movers by one-half.

Weed Control in Louisiana

NEW ORLEANS, JUNE 3, 1960: Despite the fact that this part of the country has been in the middle of a drought for the past month, the Louisiana cane crop seems to have shown some improvement as the following report by Lloyd L. Lauden, Agronomist and Field Representative of the Ameri-

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- Power centers
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  - cane levelers and knives
  - tandem mills
  - centrifugals
  - pumps
  - cranes and hoists
  - conveyors
- Motor generator sets
- Adjustable speed drives
- Gearmotors and speed reducers
- Control centers
- Industrial electronic control

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- Lighting and power distribution panels
- Micarta and insulating material
- Battery charging equipment
- Welding equipment
- Industrial heating equipment

can Sugar Cane League, dated June 1st will indicate. Mr. Lauden stated:

"The crop has made a substantial improvement in all areas in the past two weeks in both filling in stand and in the amount of suckering. Most varieties are now suckering well. In spite of the improvement in stand and in suckering, growth rates are very slow all over the belt. The crop is still behind last year's crop in height. Some growers in several areas are now reporting that stands are as good or better than their stands last year. Most growers, however, are still reporting some weak plant cane stands."

Grass and weed control are, of course, a very important part of producing a good cane crop and it is, therefore, very interesting to note that plans for an expansion of research on weed and grass control were discussed recently in a meeting of U. S. Department of Agriculture scientists and American Sugar Cane League officials. Among those attending the meeting, which was held at the Houma Experiment Station on May 30th, were Dr. W. C. Shaw of Beltsville, Maryland, head of weed research for the U.S.D.A., Dr. C. G. McWhorter, a U.S.D.A. scientist from Stoneville, Mississippi, and Dr. Thomas Sheets, another U.S.D.A. scientist also from Stoneville.

There are many new chemicals which should be tested to determine their usefulness in controlling weeds and grass in sugar cane. It is already known that some of these chemicals will kill weeds and grass, but their effect on sugar cane must be determined. Dr. Shaw believes that sugar cane may be tolerant to more of these chemicals than are cotton and corn. If this proves true, the prospects of finding good chemicals for weed and grass control in cane will be bright.

The Louisiana sugar cane farmers will be able to purchase cane for planting this coming fall that has been rogued for mosaic and heat treated for control of stunting disease. L. M. Shaffer, member of the U.S.D.A. Houma Field Station staff has announced that a committee composed of pathologists from the Louisiana Agricultural Experiment Station and the U.S.D.A. Sugarcane Station at Houma, Louisiana, together with representatives from the American Sugarcane League, have selected four growers who have agreed to cooperate in a program of producing Mosaic-rogued seed cane for sale to other growers. The growers were selected because farmers in their areas expressed an interest in purchasing Mosaic-rogued cane for planting seed plots.

The committee determined, by a careful inspection, that Mosaic infection was less than one percent in all cane selected for roguing. The percentage of ratoon stunting disease was also determined in each field selected for Mosaic disease control. "Every effort is being made", Mr. Shaffer said, "to select fields having the lowest possible infection of ratoon stunting disease."

The plan is to rogue out and destroy Mosaic plants in all plots at intervals of two weeks, or more often if necessary, during May and June, or until the cane becomes too big for further roguing. This will be done under supervision of certain committee members. A record will be made of the percentage of Mosaic found at the last roguing, and these diseased plants will also be rogued out, and this record will be furnished the grower and the purchaser of the cane for seed purposes.

It is proposed that applications for Mosaic-rogued seed cane will be handled by county agents.

The summer meeting of the American Society of Sugar Cane Technologists was held in Thibodaux on June 2nd with the newly elected President, Lloyd L. Lauden, presiding. The meeting was a well attended affair with reports on the agricultural side of the sugar business taking up the morning session of the meeting and the manufacturing section reporting after the luncheon recess. The reports presented were as follows:

Breeding in Sugar Cane with Special Reference to Kinds of Material. By *Dr. H. T. Henderson*, Louisiana State University, Baton Rouge, Louisiana.

Weed Control at Smithfield. By *Louis Arceneaux*, Smithfield Plantation, Port Allen, Louisiana.

Sugar Cane Mosaic-Vector Studies in Louisiana. By *Leon Charpentier*, U. S. Dep't. of Agriculture, Houma, Louisiana.

The 4-H Club Sugar Cane Projects in Louisiana. By *Conrad Gautier*.

Mill Settings. By *A. B. Chirgwin*, Farrel-Birmingham Corp.

The Filtration of Cane Muds with Fas-Flo Filters. By *Donald K. Luke, Jr.*, Suchar Sales Corp.

Continuous Diffusion Experiments. By *Harold F. Silver*, Silver Engineering Works, Inc.

Evaporator Control. By *J. G. Ziegler*, Taylor Instrument Co.

Brazil Restricting Production

Rio de Janeiro, May 26, 1960: Grinding, which slowed down in March, was over by May 31 in Northeast Brazil, where the season is later than in the South. The statistical position at the end of March, the tenth month of the 1959-60 season, is shown below. The corresponding figures for the same date in 1958-59 are given in brackets.

Production of *usina* sugar, 3,220,800 short tons (3,425,400);

Domestic consumption, 2,224,200 short tons (2,204,400);

Exports, 633,600 short tons (772,200);

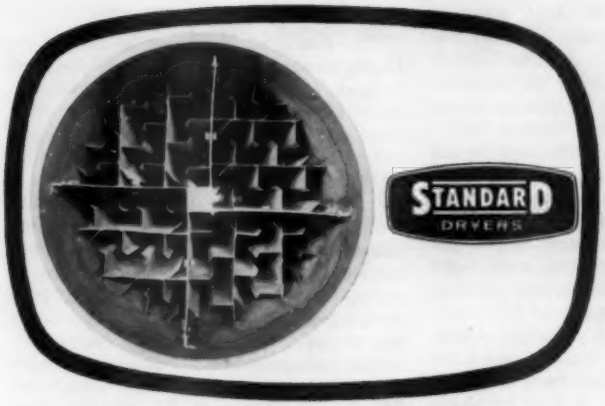
Final stocks at March 31, 363,000 short tons (448,800).

The Sao Paulo mills finished grinding in January, having produced 1,386,000 tons, or 396,000 less than in 1958-59. To avoid over-production 2,200 tons were blocked by the Institute at the mills and subsequently released when a shortage threatened on the local market. In addition, production of alcohol was increased and Brazil was able to export a surplus of some 13.5 million gallons at world prices, owing to the inclusion of alcohol in the list of products for which exporters may sell their bills at free market rates, now steady at 181 cruzeiros to the dollar. Sao Paulo's output this season is in the order of 66 million gallons, but it can be raised to 79 million if a market is found for the surplus. Pernambuco, also, sold 5.28 million gallons of alcohol abroad.

These and other measures averted an unwieldy carry-over at the end of the season, but producers, particularly in Sao Paulo, where production can be boosted to two million tons without amplifying existing installations, are anxious to develop new markets abroad, so as to minimize restrictions on output. The increase of 50,509 tons in Brazil's export quota, approved by the International Council, went some way towards restoring the previous position, prior to the reduction of 80,000 tons by the same authority, but Paulistas consider it vital to obtain the entry into the United States market, for which they have been agitating for the past two years.

The Sugar Institute, in consultation with all branches of the trade, is now completing its plans for the 1960-61 season, commencing June 1st. Planters are asking for a 30% increase in the price paid for cane and mill-owners, dissatisfied with the recent advance authorised by the Institute, are insisting on a corresponding increase in the price of sugar. Early in May, referring to a renewed threat of short supplies in Sao Paulo, the president of the Central Co-operative said 132,000 tons, released by the Institute, were being sold at the official price to meet the demand for twenty days. The Central Co-operative distributes 92% of the Sao Paulo's production.

The Bank of Brazil, comparing the 1957-58 and 1958-59 seasons reports: the Bank's loans to cane planters increased by 805 million cruzeiros, to 3,012 millions, in 1959; 100 mills produced 72% of Brazil's sugar in 1958-59, 209 mills contributing the remainder; 70 of the 100 most important mills are located in South Brazil, 30 in the North-east. The North-eastern mills ground 1.3 million tons more cane in 1958-59 than in the preceding season, but produced only 47,850 tons more sugar; the better equipped southern mills ground 6 million tons more cane and produced 4.4 million tons more sugar.



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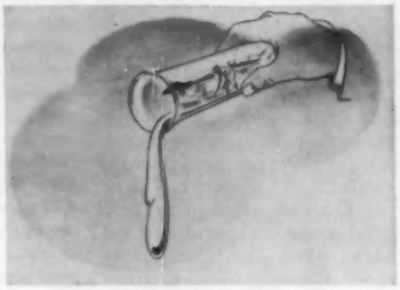

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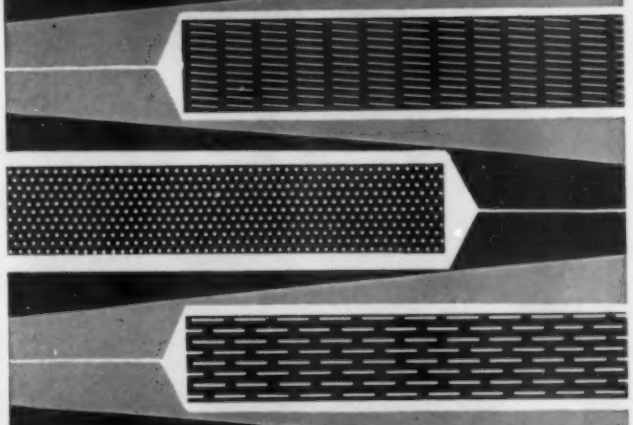

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Wallaceburg Will Not Operate in '60

MONTREAL, MAY 18, 1960: The Canada and Dominion Sugar Co. Ltd. announced it will not operate its sugar-beet processing plant at Wallaceburg for the 1960 harvesting season. The company said it had not been able to contract sufficient acreage from area farmers to warrant operating the plant.

W. H. Punchard, company vice-president, said that the company has been able to contract for only 18,300 acres that will be treated at its Chatham plant. This compares to 40,000 acres contracted for last year, he said, of which 34,000 acres were processed for what was described as a record year.

Mr. Punchard said that, although last year was a record crop, it also produced the second lowest sugar yield on record with a sugar content of 13.81%.

He said this low yield and a drop in sugar prices had led to the arbitration by the Farm Products Marketing Board of a lower sugar-beet price paid to farmers.

■

New Wonder Cane for Puerto Rico

The Agricultural Experiment Station of the University of Puerto Rico has developed a new cane variety, P.R. 1013, which is found to produce large yields of sugar. In every comparative field test it has proved to be superior to commercial varieties now cultivated in the Island. For instance, in the northern region it has yielded 11.4%, on the southern coast 42.7%, and on the east coast 28% more sugar than the present leading variety M. 336, and it has outyielded POJ 2878 by 44.8%. In a gran cultura planting (18 months of age) on the southern coast it produced 60% more sugar than B. 37161; in a "primavera" planting (12 months of age) it produced 67% more sugar than POJ 2878. In an irrigated gran cultura planting on the southern coast the new variety has yielded up to a 100 tons of cane per acre, with an average of 13.4% of sugar.

This variety is a cross between Co. 281 and POJ 2878. It is sweeter and has thicker stalks than its sister cane P.R. 980. Drouthy conditions retard its growth, but it recovers quickly under normal climatic conditions, and moreover is very resistant to the principal cane diseases.

The new variety is expected to improve greatly the situation of the sugar industry in the Island, which in recent time has failed to produce its market quota, and both the Experiment Station and the Land Authority are arranging for its rapid distribution among the planters.

Devastating Hurricanes

The Island of Mauritius in the Indian Ocean was struck by a severe cyclone early in January of this year, and before the loss resulting from this storm could be fully estimated, in February the island was again visited by another great blow that exceeded in violence any previous disturbance that is on record. In this second storm the average velocity of the wind was 105 miles per hour, but in some localities the gusts attained velocities of 130 to 175 miles per hour. In the center of the storm the barometric pressure registered 707 millimeters, the lowest ever recorded in that part of the ocean.

The damage to public buildings exceeded all precedents; 70,000 people were made homeless and 42 persons are known to have been killed. Many sugar factories suffered damage. The cane crop, which had already suffered damage from the violent storm of January was further devastated. At least 25% of the cane on most parts of the Island was broken and the remainder was flattened and stripped of leaves. The overall damage is estimated at 50% depending on the future weather up to the time of harvest.

There was much damage to warehouses and docks. The loss of stored sugar involved in the catastrophe is estimated at about 25,000 tons, of which about 6,000 tons are considered hopelessly lost.

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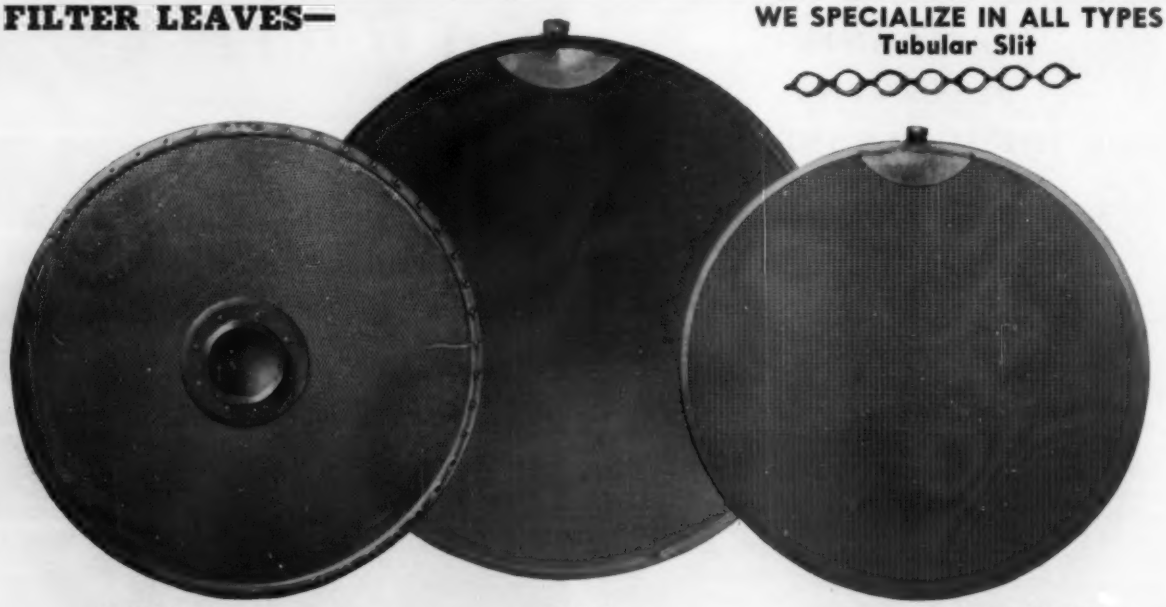

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The New Hugot Handbook

Handbook of Cane Sugar Engineering, by E. Hugot; translated and revised with collaboration of the author by G. H. Jenkins; published 1960 by Elsevier, Amsterdam; 872 pages 7¼" by 8", with 459 photos and drawings and 225 tables, $35.00.

The annual productivity of the world's cane sugar industry is becoming larger and larger, and the size of treatises on sugar manufacture is becoming bigger and bigger. There may not be any direct connection between these two phenomena, but that is the impression one gets from a look at the first English Edition of Emile Hugot's Handbook of Sugar Engineering.

Both the size of the book and the price are justified by the contents. Here is a manual that covers practically every significant detail of sugar manufacturing except routine analyses of raw materials, intermediate and final products such as cane, bagasse, juices, and molasses, etc., which are now well described in existing manuals. This is not a book for the chemist in the sugar laboratory, but for the mill's chief engineer and his assistants who are concerned with the design of the machinery and who must operate it.

The table of contents is the longest that this reviewer has ever seen in any sugar engineering work; this table occupies five whole pages and is divided into 49 chapters and these chapters are subdivided into a total of 156 topics each covering a particular phase of the continuous general operation.

The thoroughness and precision with which each topic is handled is amazing. In Chapter 1, which concerns the delivery, unloading, and handling of the cane at the factory yard, the author uses 14 pages, 11 illustrations and 14 algebraic formulas to get the cane up to the cane carrier. In Chapter 2, he takes eight pages, six illustrations and 28 formulas for the carrier to deliver the cane to the cane knives. In Chapter 3 the description of the knifing operations occupies 12 pages and is explained by nine formulas, and so on throughout the work. Each topic is thoroughly studied and when a chapter is closed the reader has a feeling that no significant detail has been left undescribed.

Following the subject of cane knives are detailed descriptions of crushers in their various forms of grooving; shredders in their many types and combinations that will give the best financial results; mill feeders and cane pushers; mill groovings; pressure in milling and their measurement, all considered from the operational viewpoint; mill speeds; mill capacity; mill settings (the author strongly recommends a certain routine method for calculating mill settings that gives excellent results, and may be used to advantage to replace the empirical methods still generally in use in the sugar industry); power requirements of mills; steam engines for mill drives; electric and turbine mill drives; mill gearing; construction of mills; imbibition, extraction and milling control; purification of juice by defecation or sulfitation; clarification with phosphoric acid; carbonation; juice heating, filtration; evaporation (100 pages); sugar boiling (66 pages); crystallization; centrifugal separation; storage and drying of sugar; sugar; molasses; vacuum equipment; steam production (91 pages); steam engines; steam turbines; pumps; fluid flow in pipes; lubricants; layout of a factory; accounting in the sugar factory.

Although the author makes free use of mathematics, he makes a practice of employing them judiciously. Since simple questions are too often presented in a tangled and consumed form, he says that he has done his best to express them clearly and to reduce them to practical formulas. Such is the case, for instance, with the calorific values of bagasse and the proportion of the heat yielded by the bagasse that can be recovered in the steam produced in the boilers. Here the use of three formulas and the selection of a few coefficients will spare the engineer long and tedious calculations and will simplify his task.

He has also introduced the solutions for certain subsidiary problems which belong to industrial physics, with the thought that it would be convenient to have ready at hand, in the same manual all the questions related to sugar manufacture whether they do or do not concern sugar as such, or are more general. This avoids the trouble of referring to unfamiliar books where the notations are different and deal with matters more diverse than those existing in sugar manufacture. In the same spirit he has extensively developed the chapter on steam turbines, which except for a few pages, would seem to lie outside the sugar factory, but he felt that he had to write this chapter in a way that would familiarize the sugar technicians with a machine they do not know very well, and that the extra information would, sooner or later, prove very useful. Along the same line he has also provided solutions to certain small problems which would seem to be within the domain of common sense, but of which there is no trace anywhere in the literature, and which appear to be unknown to most sugar technicians; these are the intermeshing of rollers with multiple grooving in the mills, the specific pressures in the mills, and the formula for centrifugal capacity. Among the new ideas introduced is a way of dealing with the circulation of massecuite in the vacuum pans, and the conclusions to be drawn for the design of pans with natural circulation.

For capacity and power of the mills, formulas are presented that are as practical and as easy to apply as the required precision allows; in this connection there is introduced a notion of "fiber control" which simplifies the generalization of figures and facilitates comparisons of working conditions in mills of different dimensions.

To this wealth of material the translator, Mr. G. H. Jenkins, in collaboration with the author, has added something from his own extensive experience in the Queensland sugar industry concerning practices and equipment in that country, including the theory and practice of cane pushers, cane feeders, and recent research on molasses exhaustion, massecuite reheating and milling problems.

There is one little matter that may cause some inconvenience. Since the majority of readers will be much interested in the British system of units of measurement, all the figures of practical interest are expressed either in British units or given in both British and metric units. Thus most American sugar engineers, if they have not already done so, must learn to think in these systems.

To the sugar engineer who is looking for the largest amount of first class information and advice, this book is strongly recommended.

O. W. Willcox

■

Securing Executive Help Can Be Efficiently Accomplished

The international sugar industry now has an efficient method of securing new management and technical employes.

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Expansion of Sugar Production in Bolivia

PRODUCTION of sugar in Bolivia in a primitive way dates from the foundation of the Republic, but it was not until about 1940 that production was begun on something like an industrial scale. The first Ingenio was La Esperanza followed by La Belgica, and later San Aurelio and Nueva Moka which is still under construction; all these are in Santa Cruz province, and all are under private management. Then in 1956, the government took a hand by building Ingenio Guabirá which is the largest mill in the country.

In that year the combined production of these four ingenios was as follows:

	Short Tons
Guabirá	**5,660**
La Belgica	**2,860**
La Esperanza	**1,140**
San Aurelio	**685**
Total	**10,345**

In the same year sugar was being imported at the rate of 47,400 short tons a year. By 1958 domestic production rose to 16,700 tons, an increase of 61.25%; official figures for the 1959 crop are not yet available but production is estimated at 26,000 tons, the increase being due to improvements at Guabirá and La Belgica.

The supply of cane for this production comes from approximately 13,580 acres. The average acre-yield of cane is about 16.5 tons; the yield of sugar percent cane ranges from 8% at Guabirá to 6% at La Esperanza.

Sugar imports are now at the rate of 38,800 short tons per annum; domestic production in 1959 is estimated at 26,200 tons so total consumption amounts to 65,000 tons; from this it may be seen that the domestic industry is supplying only 40.42% of the national requirements. The per capita consumption is 35 pounds per year.

The main reason for the lag in the domestic industry is that up to 1958 the prices paid for sugar cane at the mills have been arbitrary and consequently the cost and sale price of domestic sugars has borne no relation whatever to the cost and sale price of imported sugar. While the latter is sold at 700,000 bolivars per metric ton, the price of cane at the mill is no more than 430,000 bolivars. Under this situation the value of the raw material is only 34% of the value of the finished product.

In 1958 this condition came to a head when the farmers threatened to abandon the culture of cane, and committed various acts to give emphasis to their discontent. This agrarian ferment stirred the government into action; the interested parties were summoned to a round table conference to thrash out the dispute. A provincial new price for cane was agreed on for 1958 crop, which is to be paid until the matter is definitely settled by a National Commission for the Study of Cane and Sugar (CNECA). The first act of the CNECA was to call in foreign specialists in sugar technology to help arrange a national program.

Under the new plan the Ministry of National Economy has provided new taxes on imported sugar and other means for subsidizing the factories to enable them to pay a better price for cane. An extension of the acreage of cane planting has resulted from the new price for cane and improvement in farming practices under the direction of foreign experts, and an effort is being made to encourage cane growing by improving roads to facilitate transport of cane to the mills.

Preliminary studies are under way to build several new ingenios. When these new projects materialize in three or four years the country should be in a position to discontinue imports altogether.

■

Model Mill At British Exhibition

A working model of a sugar mill representing the last mill in a tandem driven by a steam turbine through machine cut reduction gears is one of the industrial features at the British Exhibition in New York's Coliseum. The model, exhibited by The Mirrlees Watson Company of Scotland, incorporates the company's unstrained juice return system, quick lift intermediate carrier and both the Edwards and Munson accumulators. The stand also features automatic centrifugals and other sugar making equipment as well as a photograph of the Rio Turbio mill in Venezuela built by Mirrlees Watson. The Exhibition opened June 10th and continued until June 26th.

■

New Liquid Sugar Terminal in Texas

For the first time in its 117 year history, Imperial Sugar Company is opening a branch facility away from headquarters. This is a modern liquid sugar plant in the terminal warehouse area of the Great Southwest Industrial District between Dallas and Fort Worth, Texas. Liquid sugar will be transported from the Sugarland Refinery to the new installation in special tank cars. It will be delivered into four specially constructed 15,000 gallon storage tanks under the supervision of the company's quality control and traffic departments. From this installation, liquid sugar will be delivered by tank truck to the company's customers in the important industrial area of North Texas. The facility was designed by Imperial's liquid sugar engineers and constructed by Aster Engineering Company.

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SUGAR ABSTRACTS

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SUGAR y AZÚCAR — Dr. O. W. Willcox, Editor

Agriculture

The Problem of Q. 66

J. H. BUZACOTT, *Cane Growers' Quarterly Bulletin,* Vol. 22, No. 4, pp. 136-137 (1959)

The variety of Q. 66 which was the first variety specifically developed for its resistance to lodging when grown on flat, rich, moist soils, has proved a far greater success than originally expected; so much so that it poses a problem, which is that it seems one of the most susceptible to leaf scald, chlorotic streak and bacterial mottle disease that may be prevalent in river-flat areas. On the other hand, the yields of other varieties grown on such lands are so low (due to low sugar % cane and lodging) that many plantations are tempted to grow it in spite of the disease hazard. This should be done with caution. Chlorotic streak may be controlled by hot water treatment of the planting material, but not leaf scald and some other diseases; in such case extra care should be taken to plant only cane that is known to be free of all disease. Only by continued vigilance in this respect will it be possible to retain this variety for those growers for whom it is the only profitable one to grow.

■

Evaluation of Sugar Cane Varieties

CARL W. STEWART, *Louisiana Experiment Station Bulletin No. 63* (1958)

This is a study to determine milling qualities and characteristics of four different varieties of plant and stubble cane. The idea behind this study is that in selecting new varieties of cane for commercial use, the final judgment should be based on all pertinent factors and not on field trials and chemical analysis alone. A new kind of sugar cane when first tested in the field may outrank all others in cane tonnage and sugar-per-acre and still not be the most profitable variety; it may be harder to grind, and consume more time and power to put through the milling station than other varieties which go through the mill faster, and give a juice that is easier to purify and boil, so that in the end it makes less profit.

This work, sponsored by the U.S. Dept. of Agriculture and the Louisiana A. & M. College, shows how cane varieties are judged by a milling test and other criteria. Each of eight characters is measured in the experimental mill and compared with the same characteristics of a standard variety. Each character is given a percentage rating based on the standard variety as 100%. These ratings are added together and averaged, and the variety with the highest general average is judged the best.

In this test, which included plant crops and stubble crops, the standard variety was CP. 44-101, with which three newly released canes were compared. As will be seen, the three new canes each had a higher general rating than the old one; CP 48-103 was the best, with an overall rating of 113.43 (stubble crop), and consistently held this rating throughout the four-crop test.

Rating of Characteristics—Cane Milling Tests

	CP 44-101	CP 48-103	N:Co 310	CP 47-193
Sucrose % Cane	10.67	13.92	10.47	11.57
% Standard	100.00	130.46	98.13	108.15
Sucrose % N.J.	12.03	16.00	11.92	13.33
% Standard	100.00	133.00	99.09	110.81
Purity of N.J.	75.14	83.49	75.94	78.95
% Standard	100.00	111.11	101.06	105.07
Sucrose Extd. % Suc. in Cane	91.14	89.50	89.49	89.82
% Standard	100.00	98.20	98.19	98.55
T.A. 96° Sugar Lbs. /T Cane	158.29	215.32	153.73	171.44
% Standard	100.00	136.03	97.12	108.31
Grinding Rate T/H	19.77	17.46	19.02	17.07
% Standard	100.00	88.32	96.21	86.34
Fiber % Cane	12.91	11.94	11.67	14.17
% Standard	100.00	108.12	110.63	91.11
Power KWH/T Cane	5.17	5.06	5.18	5.45
% Standard	100.00	102.17	99.81	94.86
Totals	800.00	907.41	800.24	803.20
Av. Over-all Rating	100.00	113.43	100.03	100.40

Much of CP 48-103 advantage came from its larger Cane tonnage, faster grinding rate, purity of juice, and lower power consumption.

■

Guide to the Phosphate Fertilization of Cane Fields

CONSTANCE E. HART, *Hawaiian Planters Record,* Vol. 55, No. 3, pp. 243-269 (1959)

A promising method for estimating the need for applying phosphate to a cane field is to determine the P_2O_5 content of the 8th to 10th internodes of primary stalks (counting down from the spindle). From the average of a very large number of experiments it was found that the critical level of P_2O_5 is 0.031 percent. If the P_2O_5 content of the 8-10 internodes is below this level it is probable that the crop will not respond to

an application of phosphate. On the other hand, if the P_2O_5 content of these internodes exceeds 0.045 or 0.046 percent, it is improbable that the use of phosphate will show a significant increase of yield. However, the expected result may not be attained if the soil is notably deficient in potash, nitrogen, lime and water, even though larger quantities of phosphate are used.

■

Investigation on Fertilizing Sugar Cane with Nitrogen

Report Hawaiian Sugar Experiment Station, 1958

A series of fertilizer trials with nitrogen indicated that large variations in the time of application had little effect on yields; all of the nitrogen could be applied one month after planting and the yields equaled or exceeded those from plots receiving the nitrogen in small, delayed applications. Other information indicates that splitting nitrogen applications in the plant crop shows little effect on the nitrogen content of young ratoons. In other words, late application of nitrogen to the plant crop makes little difference in either rate of growth or in the nitrogen content of the leaves of the succeeding young ratoons.

■

Grub Control in Australia

Australian Sugar Journal, Vol. 50, No. 12, p. 1008 (1959). Report of 51st Annual Meeting of the Australian Sugar Producers' Association

Some years ago the Australian sugar industry was suffering large losses from infestation of the cane fields with the greyback grub. This pest was brought under reasonable control by the use of insecticide benzenehexachloride (BHC) but has still persisted to cause considerable damage. In the Burdekin district it has been discovered that lindane can be substituted for BHC at a saving of half the previous cost. The reason for this is that lindane, being a liquid, is more effective than BHC which has been applied as a dust. It is estimated that if this spray method is widely adopted the industry will save about £100,000 annually.

■

Technology

Continuous Crystallization of Sugar Juice

JOSEPH MORZE, *Zucker*, Vol. 12, No. 1, pp. 4-7, 1959

A pilot plant for continuous crystallization of sugar beet syrup was operated in a Polish sugar factory in the campaign 1956-1957. This continuous crystallization process differs from the conventional batch process in that the apparatus is not operated under a vacuum, but under a slightly reduced atmospheric pressure.

In this process the syrup leaves the evaporators at 78-80° Brix and enters the continuous crystallizer, which has the form of a long, horizontal chamber, that is divided into 14 perpendicular sections, each containing a ribbed heating plate one meter high, so that each section is divided into two compartments through which the mass passes from the first section to the last, where it is step-wise concentrated by a strong blast of hot air at a pressure of 0.5 atm. oven pressure. By the time the syrup reaches the fourth section it becomes concentrated to the point that crystal nuclei appear of themselves; when it has been observed that the number of crystal nuclei is large enough to constitute a fillmass, further production of nuclei is interrupted by injection of steam into the vat air, and the nuclei then present begin to grow: injection of steam begins in the fifth section, or by all means in the sixth. After this section is passed the steam is shut off and only hot dry air is pumped in.

Temperatures in the sections are continually increased as the fillmass becomes drier, and expulsion of water is aided by heat absorbed from the heating plates. The finished massecuite, which now has become a magma, passes directly from the 14th section to the centrifugals. The amount of raw sugar obtained depends, as usual, on the velocity of crystallization and crystallization time. Generally, the crystallization time is shorter than in the batch process. The output of the pilot plant was about 2,500 pounds per hour. The final fillmass (93° Brix) is so emulsified with air that it is very fluid (specific weight 0.9) and flows through the sections without difficulty; but the quantity of sugar in the filled centrifugals is reduced. During this operation the color of the raw sugar was high, due to heating of the syrup with steam at 125°. The apparatus is being redesigned so that stream at a lower temperature may be used.

■

Suggestions for Increasing Milling Capacity and Reducing Costs

A. B. CHIRGWIN, *before Asociación Tecnicos Azucareros Cuba*, October 1958

Most tandems are preceded by a single set of wide-spaced knives which provide only partial preparation. Some factories have installed a second set of knives set ¾″ apart, just clearing the conveyors. Increased capacity and extraction have resulted. Close-spaced knives give preparation comparable to a shredder at lower investment cost, lower power consumption, and maintenance.

A novel tramp iron separator has been introduced. It consists of a magnetized pulley carrying a rubber belt at a high speed to thin out the cane mats. This brings the iron close to the magnetic field. The risk of costly damage to the rolls is much reduced.

Intermediate carriers constructed of chains and slats are subject to high maintenance cost. This has been largely remedied by the development of rubber belt carriers. In addition to reduced maintenance, the rubber-belt carrier allows a minimum of leakage of liquid and bagasse into the juice pans. Imbibition water is better held, and therefore is more effective. Aside from this, these carriers have a greater force-feeding action than the slat type; used with force-feed rollers, an increase in mill capacity is obtained.

Introduction of air clutches for controlling intermediate carriers has eased operation of the mill. They reduce costly breakage; when introduced into the tandems gear train, they allow full transmission of the power of the steam turbines, which again is a way to increase capacity.

■

Paraformaldehyde as a Preservative for Raw Sugar

I. R. SHERWOOD and D. LLOYD, *International Sugar Journal*, October 1958, pp. 295-296

In laboratory experiments it was found that small additions of paraformaldehyde were very effective in preventing the deterioration of raw sugar. The paraformalydehyde in form of a very fine powder was added to raw sugar that was infected with the spores of aspergillus glaucus. The most suitable proportions are one part of the paraformaldehyde to 20,000 parts of raw sugar. In a special experiment, a raw sugar containing 50 p.p.m of paraformaldehyde that was kept at 86° F. for 20 days was found to contain only nine mesophillic microorganisms per gram, against 55 per gram in the control sample. The number

of thermophiles was reduced from 365 to 110 in the intreated sugar.

From this work it may be concluded that treatment of raw sugar with paraformaldehyde will reduce the deterioration of this sugar by the microflora, even if stored under severe conditions.

The treated sugar has no unpleasant odor, and no problem of health is involved, because the paraformaldehyde depolymerises in about 12 days.

■

Use of Superphosphate in Cane Juice Clarification

J. M. SAHA, D. L. N. RAO and VIRENDRA SINGH, *Proceedings Sugar Cane Technologists India*, Vol. 26, Part II, pp. 125-134 (1958)

On the basis of extensive experiment it was found that the best method for preparation of phosphate solution to be used in clarification of cane juice by the standard sulfitation process is by agitating the solid phosphate in warm (60° C) factory condensate. Boiling definitely reduces the P_2O_5 content, especially of triple superphosphate. In so far as the CaO content of the clarified juice is concerned it makes no difference whether the superphosphate is added in the form of a slurry or settled solution. The slurry has some advantage as it involves no extra work or mechanical facilities for filtering, etc. In the case of single superphosphate the routine determination of P_2O_5 may be done directly by the oxalate method. For triple superphosphate the ammonium molybdate is more suitable; analysis by the soap method gives a figure that is too low.

■

Improvement of Distillery Yeast

G. T. REICH, *Proceedings Sugar Technologists Cuba 1956*, pp. 411-418 (1956)

This report relates to a process in which molasses is prepared for fermentation in the usual way; after the regular fermentation, the yeast is separated from the wash and subjected to a second fermentation in fresh molasses.

Starting with an original amount (500 lbs.) the refermented yeast is returned to the next original quantity of once-fermented yeast, and this refermented yeast is again refermented and so on until a bulk of 8,000 to 10,000 pounds has been obtained. The product is then dried and may be used as food for people or animals. This succession of refermentations improves the color, protein and vitamin content of the food yeast, without converting any more of the sugar in the molasses into alcohol.

(Note.—This work is of considerable importance to the food-yeast industry and is in line with previous work in Belgium in which the refermentations were made in the presence of extra phosphate, which has the effect of reducing the content of nuclear acids in the yeast that have heretofore been considered objectionable.)

■

A New Formula for Reduced Mill Extraction

B. L. MITTAL, *Proceedings Sugar Cane Technologists India*, Vol. 26, Part II, pp. 137-139 (1958)

Comparison of different mills that crush cane of varying fiber content is meaningless unless the influence of fiber on mill extraction is completely eliminated or theoretically reduced to a standard level of fiber % cane. The Noel Deerr formula for

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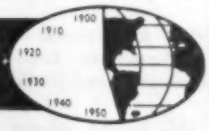

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this purpose is

$$e' = \frac{7 \cdot V}{7}$$

where e′ is the reduced mill extraction and V is the juice lost per unit fiber in cane. This formula is accepted by almost all sugar cane technologists. The standard level of fiber content is here taken as 12.5% cane.

The expression for V appears sound, but there is a fundamental error in the derivation. The value of mill extraction e′ is determined on the basis of pol extraction and not on juice extraction and this involves the assumption that the cane consists of fiber and juice of homogenous structure only. But nowhere, does cane fulfill this ideal condition. The author mathematically analyzes the situation in detail and arrives at a formula,

$$e' = 1 - (0.125/f) \times P/_{bc} /P_c$$

where f is fiber per unit cane, P_{bc} is pol in bagasse per unit cane, and P_c pol per unit cane. In this formula the influence of varying fiber is completely eliminated. In a table it is shown that with pol per unit cane, pol per unit bagasse and fiber per unit bagasse remaining the same, the reduced mill extraction increases according to the Deerr formula but remains constant according to the new formula, which is, therefore, a definite improvement over the old one.

■

Books

A Adubacao de Cana de Acricar (Fertilization of the Sugar Cane)

FREDERICO PIMENTAL GOMES and ENO DE MIRANDO CARDODO; *published by Editoria Agronomica "Ceres" Ltd.*, Paranapiacaba 93, Sao Paulo, Brazil, 118 pages

Although the sugar cane was introduced into Brazil by the first colonizers more than 400 years ago, and now occupies a large place in the economy of this nation of 63 million inhabitants, there has not been available a systematic treatise in the Portuguese language on the fertilizer needs of this crop. The authors, both of whom are agricultural engineers at the University of San Paulo, have undertaken to fill this gap. The main fertilizer materials and soil correctives are described and the basic principles of plant nutrition are explained. There is a chapter on green manuring, the preparation of compost, and a chapter on "hunger signs" as indication for the need for nitrogen, phosphate and other nutrients.

A large section of the book is given to typical experiments in the field on various phases of cane fertilization and times of application in different districts. The results of these experiments show that the soils of Brazil respond well to treatment with fertilizers. Now that this information is made readily accessible to the man in the field it should be possible to increase the output of sugar and lower its cost, with benefit to Brazil's export position. The book is printed on bagasse paper manufactured by Refinadora Paulista.

■

Principles of Sugar Technology, Vol. II

Edited by P. HONIG *and published 1959 by Elsevier Publishing Co., Amsterdam, London, New York, Princeton;* 567 pages, 272 illustrations and 92 tables. $19.00.

This second volume of Principles of Sugar Technology is designed to give a complete summary of the crystallization process as it is applied today in the sugar industry all over the world, and a description of the control systems and theories concerned with sugar crystallization. The editor has functioned as a master of ceremonies who invited a number of eminent men in the industry in different countries to contribute chapters setting forth their concepts of a special phase of the subject in which they are experts.

The work is divided into 14 chapters, as follows: Chapter 1.—Crystallography of Sucrose, by H. E. C. Powers (London). The characteristics of sucrose crystals, their form, physical properties and internal structures and sizes.

Chapter 2.—The Solubility of Sucrose in Impure Solutions, by F. H. C. Kelly, (Tasmania). Describes solubility determination, and various phases of sucrose solutions.

Chapter 3.—Nucleation in Supersaturated Sucrose Solutions, by Andrew Van Hook (College of Holy Cross); the formation of crystals and the phenomena of seeding massecuites.

Chapter 4.—Kinetics of Crystallization of Crystals, by Andrew Van Hook. Treats of the various influences that affect the growth of crystals.

Chapter 5.—The Chemistry of Crystallization, by Pieter Honig. Deals with the action of non-sugars and their reactions with sucrose in sugars and how the non-sugars may be determined.

Chapter 6.—Control Methods and Equipment in Sugar Crystallization, by T. R. Gillett (Crockett, Calif.). The development and importance of control methods and their applications; pan control equipment and automatic controls, etc.

Chapter 7.—Application of the Conductivity Method to Control the Crystallization Process and Seeding Technique, by Pieter Honig (New York). Conductance of and technical conductivity control, and its application in various countries; conductivity on the pan floor; a new system of special seeding for the footing of C strikes, etc.

Chapter 8.—Determination of Heat Transmission as a Method for Determining Viscosity and Supersaturation of Technical Sugar Solutions, by R. C. L. Bosworth (Sydney). Relations between Viscosity and supersaturation and their variations under heating, etc.

Chapter 9.—Technology of Sugar Crystallization, by W. F. Alewiju (formerly of Java), and Pieter Honig. Technology of crystallizing granulated sugar; crystallization equipment; significance of circulation on supersaturation; technical control instrument for conductivity control, etc.

Chapter 10.—Evaporation and Circulation in the Crystallization Process, by R. C. L. Bosworth (Sydney). Evaporation driving forces on evaporation, crystallization and circulation, and the corresponding resistances; measurements of pan circulation; circulation patterns and their interpretation.

Chapter 11.—Natural and Mechanical Circulation in Vacuum Pans, by A. L. Webre, I. (Merion, Pa.), Coil pans and calandria pans, floating calandrias; the real mechanism of natural circulation; II. The rehabilitation of mechanical circulation, the necessity of mechanical circulation; speed and power requirements; III. equipment and operating conditions for satisfactory pan performances, etc.

Chapter 12.—Crystallization of Massecuites by Cooling, by G. C. De Bruyn (Amsterdam). Rate of crystallization of sucrose; construction of cooling elements; crystallizer control and control instruments; boiling schemes, etc.

Chapter 13.—Conditioning of Massecuites in Crystallizers, by J. H. Payne (Honolulu); Use of saturoscope, rheology of molasses and massecuites; viscosity; crystal content and size; cooling; reheating and diluting; molasses exhaustibility, etc.

Chapter 14.—Maximum Recovery of Crystallized Sucrose from Low-grade Boilings, by K. Dowes Dekker. Phase Rule considerations; methods of judging purities of final molasses based on exhaustion of final molasses, etc.

Each chapter is followed by a bibliography. The reader may buy this book with assurance that he is getting the points of view of eleven of the world's most eminent experts in the whole science and art of sugar crystallization.

Progress at American Sugar Refining

"Refined sugar deliveries this year to date by the Company and the sugar industry as a whole are slightly higher than those for the same period of last year. It is still too early to make an estimate of our earnings for 1960," said William F. Oliver, president, American Sugar Refining Company, at the annual stockholders meeting on April 20th.

"Our two Cuban mills are expected to finish their crops within the next two weeks. Representatives of the Cuban National Agrarian Reform Institute have already occupied or taken over the management of a substantial part of our non-cane producing lands in Cuba and have recently indicated that they are about to take over the management of most of the balance of our land, including areas devoted to the production of sugar cane. They have not indicated to us any intention to take over our mills or industrial areas in Cuba. No actual expropriation proceedings under the law have been started nor has any compensation in any form been offered us for these properties.

"Work on our new Boston refinery is proceeding satisfactorily and it is expected that this plant will be in full operation later in the year.

"A new bulk raw sugar vessel of about 9,000 deadweight tons, the *M/V Domino Crystal,* was delivered to a subsidiary of our Company in February of this year. It is now in operation and has already discharged its first cargo of raw sugar at Boston."

■

A New Scientific Director for Sugar Research Foundation, Inc.

Dr. John L. Hickson has been elected Vice President and Scientific Director of Sugar Research Foundation, Inc. He succeeds Dr. Henry B. Hass who has resigned but will continue as consultant of the Foundation. Dr. Hickson is also Chairman of the Carbohydrate Section of the American Chemical Society, Chairman of the New York Chapter of the American Institute of Chemists and a member of the Institute of Food Technologists.

■

A Quality Control House for Imperial Sugar

An ultra-modern, six-story, $500,000 "quality control house" is being constructed at Imperial Sugar Company's refinery in Sugar Land, Texas. This new building will increase the refinery's white sugar granulator and drying capacity by 50%, and will contain one of the most complete and modern brown sugar systems in the United States. The equipment in the new unit will give greater capacity and will maintain and uniformly improve the sparkling appearance of granulated sugar. Also there will be a completely new automatic system for the manufacture, storage handling and packaging of all three kinds of brown sugar—light, medium and dark. The brown sugar storage area in the new building, located adjacent to the loading dock, will increase shipping facilities.

■

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First change in granulated sugar packaging in more than twenty years is announced by the Great Western Sugar Company. The new "Poly Sack" is a transparent polyethylene sack which allows customers to see what they are getting. Easy handling of the 5-pound package is a big convenience in shopping and for home use. For the retailer, breakage in handling is greatly reduced and the sacks eliminate sifting on the shelves. Eye appeal to the sugar section of the store is enhanced by the display of this glistening sack.

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Filter Press Muds

(*Continued from page* 28)

Tests of mechanically composted material show the benefits of this method.

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■

New Mill For Tanganyika

A mill and refinery with a capacity to produce initially 20,000 tons of refined sugar annually will be constructed on the Great Ruaha River in the Kilombero Valley, Tanganyika, Africa. The Kilombero Sugar Company has acquired a concession of fertile land from the Tanganyikan Government and is clearing 7,000 acres for sugar cane. Plans call for increasing the output capacity of the mill and refinery to 30,000 tons annually when increasing consumption warrants. Per capita consumption is now at the low level of 10 lbs. per year and all sugar is imported. The mill will be operating in 1962. Total cost is estimated at £3,210,000 of which the International Finance Corporation, the Colonial Development Corporation, the Netherlands Overseas Finance Corporation and Vereenigde Klattensche Cultuur Maatschappij will provide £2,3000,000. Shares amounting to £700,000 will be offered to Africans and a suppliers' credit of £210,000 will make up the full amount.

■

Sugar Cube Presses

The Standard-Hersey pressed sugar process is described in the new two-color catalog now available from Standard Steel Corp., Los Angeles, Calif. Catalog 603 contains technical data on cube presses, and lists the various sizes of tablets, blocks, cubelets and bars that can be produced with them. A complete cube sugar system, along with specifications for the different components is described. Also the catalog contains information on Standard rotary dryers and coolers.

■

A Record Cane Yield

In an all-India cane growing contest (1959) a farmer in Andhra State topped the list of competitors by producing 4,098 mounds, 168 tons, of mill cane from one acre. At the prize giving ceremony at new Delhi, Prime Minister Nehru told a large gathering of farmers that it is only through the twin method of adopting modern techniques and hard labor that they could raise the agricultural production of the country.

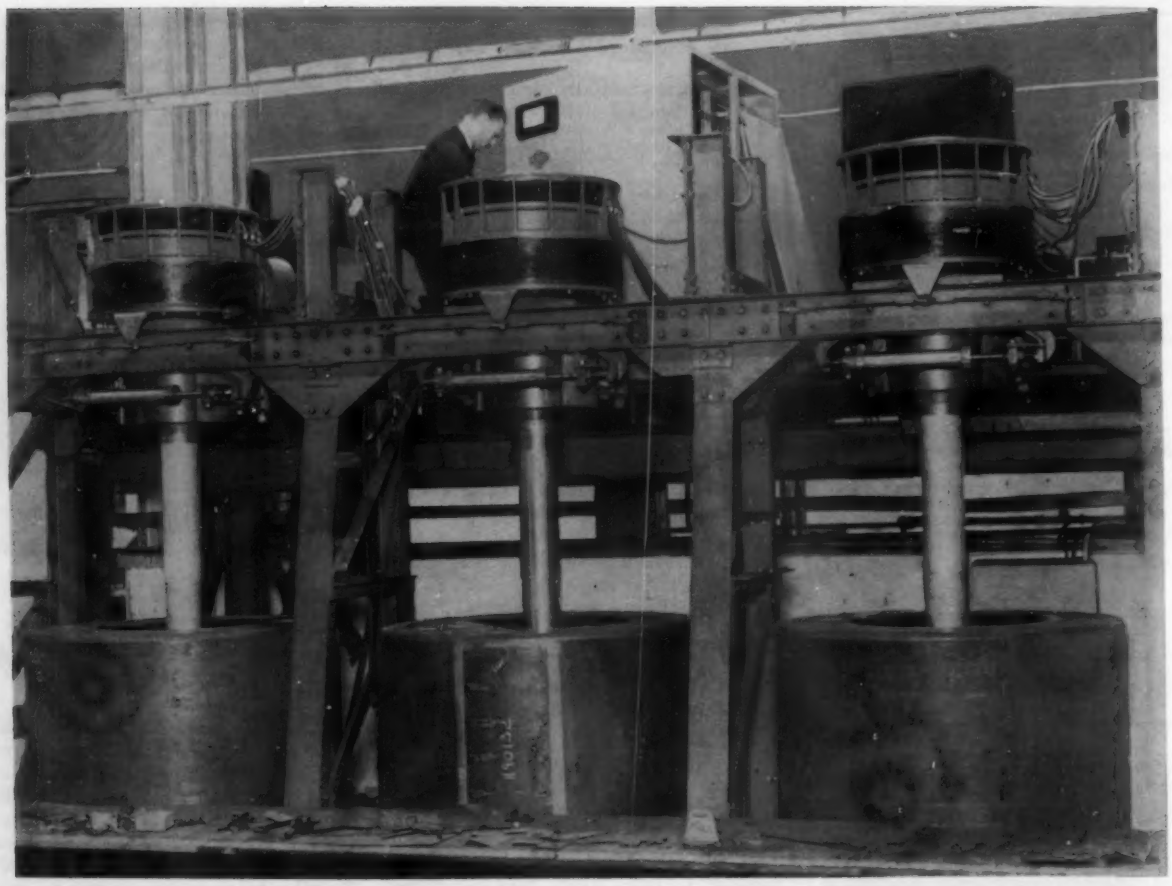
■

New Sugar Factory Recommended for Vietnam

A ten-man commission from Formosa has completed a preliminary report recommending the establishment of a new sugar factory with a capacity to produce 20,000 tons of sugar in Vietnam. The report was made at the request of the government of Vietnam and followed a thorough study of the sugar industry and the supply situation in that country. The recommended location of the new mill is Tuy-Hoo where 50,000 acres suitable for cane cultivation are available.

According to the "Australian Sugar Journal" there is now only one modern raw sugar factory and refinery in Vietnam. The Heip Hoa factory has a grinding capacity of 900 metric tons of cane per 24 hours. It was established in 1885. Its present day operation is around 600 tons a day. Khanh Hoi refinery has a melting capacity of 60 tons of raw sugar. Both of these establishments are owned by the Vietnam Sugar Corporation, a joint investment of French sugar interests and the Vietnam Government.

In 1958 the Corporation produced less than 5,000 tons of sugar, which was nevertheless much better than the 1957 production of 1,100 tons of sugar. Nearly 21,000 tons were produced in the small old-fashioned plants, giving a 1958 output of something around 26,000 tons, which meant that to meet the local demand over 50,000 tons had to be imported. This loss in foreign currency was a serious matter to the Government which has decided to push on with a scheme to develop the sugar industry in order to provide more employment and at the same time relieve the drain on foreign exchange.



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Ventajas del "Composting" Mecánico

Optima Utilización de los Lodos del Filtro-Prensa

Por el Dr. William L. Owen

En un artículo anterior (1), el autor trató la cuestión del "composting" de los lodos de los filtros-prensas de los ingenios azucareros desde el punto de vista de las condiciones que deben mantenerse para la efectiva reducción de la materia orgánica de dichos lodos para convertirlos en alimento para las plantas que estaría disponible inmediatamente para la nutrición de las mismas. Para definir el término "composting" en el sentido en que utilizamos la palabra, podríamos citar de la obra publicada por Jann, Howard y Salle (2) en la cual lo definan como sigue: "El 'composting' es la degradación biológica de materia orgánica que contiene una variedad de compuestos que se descomponen facilmente para que quede convertida en un producto o masa relativamente estable. Se produce así un producto o masa que no se descompone ni causa olores ofensivos tan facilmente como la sustancia original." Como mencionamos en nuestro artículo anterior, las condiciones esenciales para la rápida descomposición son (1) un abundante paso de aire por la masa, (2) una temperatura que se mantiene en los 55 grados Centígrado, (3) el mantenimiento de un contenido óptimo de humedad de un 60 a 70% y la presencia de una amplia provisión de sustancia vegetal. Aunque los residuos orgánicos de la cosecha o la fabricación pueden descomponerse rápidamente bajo condiciones tanto aeróbicas como anaeróbicas, las condiciones aeróbicas promueven una descomposición más rápida, y al mismo tiempo se producen un mínimo de productos intermedios maloliente. Además, el pH de la sustancia queda, por regla general, reducido bajo condiciones de fermentación anaeróbica, mientras, bajo las de fermentación aeróbica, se desarrolla una reacción alcalina más deseable.

En relación con esto, surge ahora la cuestión de si se pueden mantener, por medio de un sistema continua de manejo mecánico, todas estas condiciones para la degeneración rápida. Como se mencionó en un artículo anterior, existen varias compañías que se especializan en la fabricación de aparatos para producir el compuesto final de materiales de deshecho por un proceso semicontinuo. Por medio de la cooperación de una de las compañías azucareras de Louisiana, el que suscribe hizo embarcar, en una ocasión, a la Sanitary Disposal Corporation de Lansing, Michigan, varios pies cúbicos de lodo de filtro-prensa y bagacillo, para que fuese procesado por medios mecánicos. El producto logrado bajo las condiciones allí y con su equipo resultó ser insuficientemente descompuesto y pruebas en ollas de dicho material indicaron que la proporción de carbono a nitrógeno en el lodo degenerado era aun demasiado grande para dejar disponible para uso de las plantas el nitrógeno en el material. Este material fue colocado entonces en embudo Buchner grande y aerado diariamente durante un período de dos semanas, durante cuyo tiempo el material fibroso fue reducido a una consistencia homogénea.

Jann, Howard y Salle (2) han estudiado la rápidez del proceso de "composting" en distintas materias primas a temperaturas diferentes, y sus resultados se reproducen a continuación:

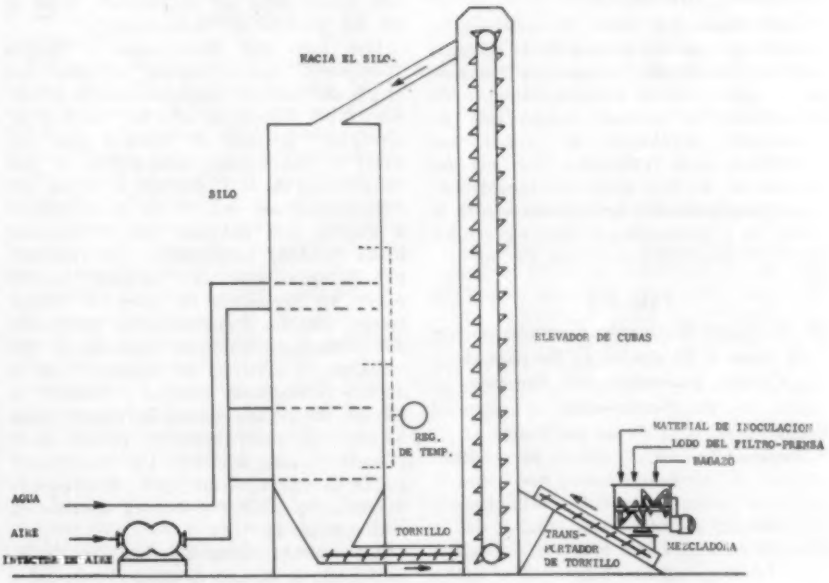
DETERMINACIÓN DEL FIN DEL PROCESO DE "COMPOSTING"
(Determinación del abono crudo y "composted" de corral de ganado con posos gastados de café)

Determinación	Porcentaje o Proporción	
	Abono Núm. 1	Abono Núm. 2
Carbono Crudo	20% Café	30% Café
Carbono "Composted"	48.4	48.5
Nitrogeno Crudo	44.1	43.9
Nitrogeno "Composted"	2.66	2.61
C : N Proporción	3.41	3.40
Crudo	18.6 : 1	18.6 : 1
C : N "Composted"	12.9 : 1	12.9 : 1

Los mencionados autores también "composted" abono estable con los resultados consignados en el cuadro reproducido a continuación.

Determinación	Porcentaje o Proporción	
	Muestra 1	Muestra 2
Carbono Crudo	38.6	51.4
Carbono "Composted"	47.4	44.8
Nitrogeno Crudo	2.07	2.10
Nitrogeno "Composted"	2.52	3.15
C : N Proporción Crudo	13.1	24.1
C : N "Composted"	15.1	14.1

Comparado con la referida muestra de abono "composted," la composición de nuestro "compost" completado de lodo del filtro-prensa y bagazo es como sigue:



Proceso Mecánico de "Composting" D Lodo Librado del Filtro.

Hierba Invernal sobre Arena Lavada que Contiene Lodo para "Composting."

Carbono — 29.5
Nitrogeno — 2.1

Proporción Carbono : N — $\frac{29.5}{2.1}$ — 14.0

Se observará que la proporción final de Carbono : N de nuestro producto ha sido reducido a aproximadamente la del abono "composted" terminado.

Jann, Howard y Salle (3) también ha descubierto que una prueba de la terminación del proceso de "composting" consiste en la aplicación al material, después de completarse un período considerable de condiciones aeróbicas, de condiciones anaeróbicas bajo las cuales, si el pH del material no declina, puede ser considerado como completamente descompuesto. En la Tablo No. 1, publicada por ellos, ofrecen los siguientes datos para esclarecer ese punto:

TABLA 1

pH de Abono Mantenido Anaeróbicamente en Agua a 53 grados C. Después de Ciertos Intervalos del Proceso de "Composting"

Horas en el "Composter"	pH en Tubo 0 hrs.	24 hrs.	48 hrs.	72 hrs.
0	8.6	6.4	6.1	6.1
24	8.5	6.4	6.2	6.2
58	8.5	6.4	6.3	6.3
72	8.7	6.7	6.4	6.3
96	8.6	7.0	6.4	6.3
120	8.7	7.6	7.0	6.8
144	8.6	7.5	7.0	7.08

Se observará que, después que el material había sido "composted" a una temperatura de 55 C durante 144 horas, el pH comenzó a subir tras de ser expuesto a condiciones anaeróbicas. De manera que este punto debe ser considerado como el fin del período de "composting".

Con lodo del filtro-prensa y bagazo "composted" mecánicamente, hallamos que el pH del material aeróbicamente incubado fue 8.0 pH después de salir del "composter" mecánico. Después de exponer este material a condiciones anaeróbicas a una temperatura de 55 C durante 72 horas, nos encontramos con que el pH había subido a 8.4, lo que indicaba que el material había quedado estabilizado. Es aparente, por lo tanto, que un "compost" estable puede ser preparado de lodos de prensa frescos aun sin desparafinación por medio de condiciones aeróbicas sostenidas. Sin embargo, el material no desparafinado es de una consistencia gomosa, y requiere la adición de alguna sustancia vegetal para hacerlo lo suficientemente poroso para permitir el paso del aire. Un "composter" mecánico para lodo del filtro-prensa diseñado por Carter y Nansen aparece en el dibujo anexo.

Este aparato ofrece las siguientes facilidades: (1) la manera de girar el material a frecuentes intervalos para asegurar acceso completo del aire a todas partes del mismo; (2) medios para la aereación del material por inyectores de aire en el interior del silo; (3) medios para la inoculación inicial del material con cultivos de microbios especialmente preparados, propagados en una porción del "compost", previamente preparada; (4) medios para la adición de un constituyente molido de deshecho de caña o bagazo; (5) facilidades para el suministro de agua para humedecer el material de tiempo en tiempo para mantener un nivel óptimo de humedad; (6) facilidades para suministrar aire cálido a la masa, especialmente al principio del proceso.

Es esencial, lo mismo por razones de economía que por eficiencia, que el lodo del filtro-prensa sea procesado tan pronto como sea posible despues de salir de las prensas en la fábrica. Al hacerlo así, se conserva la humedad y calor del material y su material fermentable se hace disponible inmediatamente para las especies de microorganismo que suministra el inóculo que se utiliza.

De esta manera, se estimulan aquellas actividades microbiales que son esenciales para la producción del material fertilizante más deseable en el tiempo más corto posible. También ofrece el "composter" mecánico facilidades para suministrar aire caliente al material del "compost" en las etapas iniciales de la descomposición. Aunque la reacción exotérmica del proceso de "composting" desarrolla su propio calor, es preferible accelerar dicha reacción en sus etapas iniciales con el uso de aire cailente. Después que la temperatura de la masa ha comenzado a subir, el aire caliente suministrado por el inyector de aire es substituido por aire a la temperatura de la atmósfera.

Existen dos métodos para determinar la terminación del proceso de "composting"; uno es el método descrito anteriormente, según fue evolucionado por los autores ya mencionados, que consiste en la incubación de parte del material bajo condiciones anaeróbicas, para determinar si despide olores desagradables, y el otro consiste en determinar si la temperatura del material ha descendido al nivel de la temperatura atmosférica.

Desde luego, los datos más reveladores se obtienen de la determinación de la proporción de carbono : nitrógeno en el material en distintas etapas del proceso de "composting", pero este resulta un método muy largo y laborioso, y aun cuando el contenido de ceniza en el material se utiliza como medio de determinar aproximadamente la cantidad de carbono que contiene, esto constituye un proceso dificultoso y su exactitud queda gravemente disminuida por la dificultad de obtener una muestra uniforme de la masa que se convierte en "compost".

(Sigue en la página 72)

El Nuevo Manual Hugot

Manual sobre Ingeniería de Caña de Azúcar, por E. Hugot, traducido y revisado, con la colaboración del autor, por G. H. Jenkins; publicado en 1960 por Elservier, Amsterdam; 872 págs. 7¼" por 8", con 459 fotografías e ilustraciones y 225 tablas, $35.00.

La productividad anual de la industria mundial de caña de azúcar aumenta constantemente, y los tratados que se escriben sobre la fabricación de azúcar también tienden a aumentar cada vez más en tamaño. Es posible que no exista relación directa entre los dos fenómenos, pero esa ciertamente es la impresión que recibe uno al hojear la primera edición en inglés del Handbook of Sugar Engineering (Manual sobre Ingeniería Azucarera) por Emile Hugot.

Pero el contenido del libro justifica tanto el tamaño como el precio. He aquí un manual que abarca practicamente todo detalle significativo del proceso de fabricacíon de azúcar, a no ser los análisis rutinarios de las materias primas y los productos intermedios y finales, tales como la caña, bagazo, jugos y melazas, etcétera, que ya han sido descritos minuciosamente en manuales existentes. Este libro no es para el químico en el laboratorio azucarero, sino para el ingeniero jefe del ingenio y sus ayudantes, quienes se ocupan del diseño de la maquinaria y su operación.

La tabla de materias es la más extensa que he visto en cualquier obra de ingeniería azucarera que jamás he revisado; dicha tabla ocupa cinco páginas enteras y está dividida en 49 capítulos y los capítulos se subdividen en un total de 156 materias, cada una de las cuales abarca una fase especial del proceso general de la fabricación de azúcar.

La minuciosidad y la precisión con que se ha tratado cada materia son asombrosas. En el primer capítulo, que se refiere a la entrega, descarga y manipulación de la caña en el patio de la fábrica, el autor utiliza 14 páginas, 11 ilustraciones y 14 fórmulas algebraicas para llevar la caña hasta el portacañas. En el segundo capítulo, le lleva ocho páginas, seis ilustraciones y 28 fórmulas para que el portacañas entregue la caña a la cortadora. En el Capítulo 3, la descripcíon de las operaciones de corte ocupa 12 páginas y se explica por medio de nueve fórmulas. Y así a través de toda la obra; cada materia se estudia a fondo y al terminar un capítulo el lector se siente convencido de que ningún detalle significativo ha quedado sin describirse.

Al capítulo sobre la cortadora de caña le siguen descripciones detalladas de desmenuzadoras con sus distintos tipos de acanaladura; desfibradoras en sus numerosas variedades y combinaciones que dan los mejores resultados económicos; alimentadores de caña a los molinos; acanaladura de los molinos; presión de molienda y sus medidas, considerado todo desde el punto de vista funcional; velocidades de molienda; capacidad de los molinos; ajuste de los molinos (el autor recomienda enfáticamente una cierta rutina en el método para calcular los ajustes de los molinos que rinde excelentes resultados, y que puede ser utilizado con ventaja para reemplazar los métodos empíricos que aun se emplean generalmente en la industria azucarera); energía que consume los molinos; máquinas de vapor para accionamiento de molinos; mandos de molino eléctricos y de turbina; engranajes de molino; construcción de molinos; imbibición extracción y regulación de molienda; purificación del jugo por defecación o sulfitación; clarificación con ácido fosfórico; carbonatación; calentamiento del jugo, filtración; evaporación (100 páginas); hervido del azúcar (66 páginas); cristalización; separación centrífuga; almacenaje y secado del azúcar; azúcar; mieles; equipo al vacío producción a vapor (91 páginas); máquinas y turbinas a vapor; bombas; corriente de flúidos en las tuberías; lubricantes; distribución de una fábrica; contabilidad en la fábrica azucarera.

Aunque el autor utiliza libremente las matemáticas, acostumbra hacerlo de una manera juiciosa. Puesto que las questiones sencillas se presentan con demasiada frecuencia en una forma enredada y confusa, ha hecho todo lo posible, según dice, para expresarlas claramente y reducirlas a fórmulas prácticas. Tal es el caso, por ejemplo, con el valor calorífico del bagazo y la proporción del calor que rinde el bagazo y que puede recuperarse en el vapor producido por las calderas. Con el uso de tres fórmulas y la selección de unos cuantos coeficientes se evitan para el ingeniero largos y tediosos cálculos, simplificando así su trabajo.

Asimismo ha ofrecido las soluciones a ciertos problemas secundarios que pertenecen a la física industrial, por considerar que sería conveniente tener a mano, en el mismo manual, todas las cuestiones relacionadas con la fabricación de azúcar, ya sea refiriéndose directamente al azúcar como tal, o de naturaleza más general. Esto evita la molestia de tener que recurrir a libros poco conocidos donde las anotaciones son diferentes y tratan de materias más diversas que las concernientes a la fabricación de azúcar. En el mismo plano, ha desarrollado extensamente el capítulo sobre las turbinas a vapor, que, a excepción de unas cuantas páginas, parecería estar fuera del ámbito de la fábrica azucarera, pero el consideró conveniente escribir dicho capítulo de manera que los técnicos azucareros pudiesen familiarizarse con una máquina que no conocen muy bien, y que tarde o temprano, la información adicional resultaría muy útil. De la misma manera, ha facilitado soluciones a ciertos problemas menores que parecerían estar dentro de la esfera del sentido común, pero de los cuales no aparece rastro alguno en la literatura azucarera, y que desconocen, al parecer, la mayoría de los técnicos de la industria; estos problemas se refieren al encaje de los rodillos con la acanaladura múltiple en los molinos, las presiones específicas en los molinos y la fórmula para la capacidad centrífuga. Entre las muevas ideas introducidas hay un modo de manejar la circulación de la masa cocida en los tachos al vacío, y las conclusiones a que puede llegarse para el diseño de tachos de circulación natural.

Para la capacidad y potencia de los molinos, se ofrecen fórmulas que son tan prácticas y fáciles de aplicar como permite la indispensable precisión; en relación con ésto, se introducen nociones sobre la "regulación de la fibra" que simplifican la generalización de las cifras y facilitan comparaciones de condiciones de trabajo en molinos de distantas dimensiones.

A esta abundancia de material, el traductor, Sr. G. H. Jenkins, en colaboración con el autor, ha añadido algo de su propria y amplia experience en la industria azucarera de Queensland, referente a prácticas y equipos en aquel país, incluyendo la teoría y práctica de los alimentadores y empujadores de caña y estudios recientes sobre el agotamiento de las mielas, el recalentamiento de la masa cocida y problemas de la molienda.

Existe un pequeño problema que puede causar cierta dificultad. Puesto que la mayoría de los lectores tendrán mucho interés en el sistema británico de unidades de medida, todas las cifras de interés práctico se expresan en unidades británicas o tanto en unidades británicas como las métricas. Por lo tanto, la mayoría de los ingenieros azucareros norteamericanos tendrán que aprender a pensar en ambos sistemas, si es que no lo han hecho ya.

Este libro es altamente recomendable para los ingenieros azucareros que buscan la mayor cantidad posible de información y consejos de primera clase.

O. W. Willcox.

■

Saco de Azúcar Transparente

La Great Western Sugar Company ha anunciado el primer cambio en el empaque de azúcar granulado en veinte años. El nuevo "Saco Poly" es un saco transparente de polietileno que permite al cliente ver lo que recibe. El fácil manejo de dicho saco de cinco libras constituye una gran ventaja, lo mismo al hacer las compras que dentro de la casa. Para el detallista, los nuevos sacos significan una reducción considerable de pérdidas por rompimiento de envases y eliminan la filtración de azúcar sobre los entrepaños de las tiendas. La presencia de este reluciente saco llama la atención a la parte de la tienda donde se vende azúcar.

Un transportador de 36 pulgadas de ancho illeva el azúcar crudo del Salón de las Pesas, en el fondo, 1122 pies hasta el caballete de carga a una velocidad de 700 toneladas por hora en el sistema modernizada de carga del Central Aguirre.

Aguirre Moderniza las Facilidades Para el Embarque a Granel

La Central Aguirre Sugar Company—uno de los productores más grandes de azúcar crudo en la isla de Puerto Rico—que introdujo el manejo de azúcar a granel en Puerto Rico poco después de la Segunda Guerra Mundial, ha terminado la modernización de sus facilidades, que han sido proyectadas para acrecentar grandemente la capacidad de almacenaje y las operaciones de carga de barcos. El Central Aguirre se une ahora a la South Porto Rico Sugar Company en Gúanica y el Central Coloso en Aguadilla para dar a Puerto Rico tres instalaciones de alta capacidad para el manejo de azúcar a granel—todas las cuales han sido técnicamente proyectadas y equipadas por Stephens-Adamson Mfg. Co., de Aurora, Illinois, E.U.A., en colaboración con la gerencia e ingenieros de las citadas empresas.

La mejora en el Central Aguirre se realizó gracias a la visión y planeamiento del Sr. Eugenio Rice, presidente de la empresa, que hizo la conversión para el manejo de azúcar a granel con un mínimo de gasto de capital y utilizando las facilidades existentes cuandoquiera que fué posible. El azúcar se cargaba proveniente de tolvas en los almacenes en cajas de 2½ toneladas de capacidad que se cargaban en vagones de ferrocarril, los cuales pasaban por una vía por debajo del almacén. Las cajas se transportaban después al muelle donde los botalones del barco las izaban sobre la bodega del barco, siendo descargadas en un arrumador especial (lanzador centrífugo) Stephens-Adamson. El sistema, si bien representaba una mejora sobre el antiguo, era inadecuado y tenía una capacidad limitada para la carga de barcos.

Encargóse a la Stephens-Adamson Mfg. Co. que diseñase el sistema de alta capacidad recientemente completado. Se reemplazaron las vías del ferrocarril debajo del silo del almacén con dos transportadores de correa de 0,76 m. de ancho, cada uno con una capacidad de 350 toneladas por hora y una velocidad de 122 m. por minuto. Las compuertas debajo del silo, que son hidráulicamente accionadas, se controlan en forma de que funcionen una de cada vez, alimentando 300 toneladas de azúcar por hora a un par de tolvas viajeras que alimentan a cada transportador. Los dos transportadores de 0,76 m., a su vez, alimentan a un transportador de 0,91 m. que tiene una capacidad de 700 toneladas por hora y una velocidad de la correa de 183 m. por minuto, el cual conduce el azúcar hasta una dependencia donde se pesa por tandas.

Desde esta dependencia se traslada el azúcar hasta el pórtico de carga de barcos situado a una distancia de 342 m. sobre un transportador de 0,91 m. que tiene una capacidad de 700 toneladas por hora y una velocidad de la correa de 183 m. por minuto. En el pórtico permanente para la carga de barcos, un transportador de botalón de 18,30 m. alimenta una canaleta telescópica en el extremo inferior de la cual va montado un arrumador de barcos Stephens-Adamson de 0,76 m. El botalón puede hacerse girar sobre un arco de 70 grados y puede subirse y bajarse la canaleta para permitir que el arrumador de barcos (conjunto lanzador centrífugo) pueda cargar más de una tanda sin tener que mover el barco.

Mientras que anteriormente se tardaban dos o tres días para cargar un barco, con el nuevo sistema de alta capacidad los barcos pueden entrar y salir del puerto del Central Aguirre en menos de 24 horas.

Una característica de la instalación de los transportadores la constituye el diseño de los largueros y cubierta. Se emplea una combinación de larguero y cubierta integrada por una placa doblada de una sola pieza. Esta construcción brinda una apariencia nítida de líneas aerodinámicas, que ofrece un mínimo de irregularidades. Se simplifica la resistencia máxima a la corrosión y las operaciones de lavado que son esenciales a la higiene de las operaciones azucareras. El diseño de las compuertas y la disposición de las tolvas viajeras proporcionar. la entrega de una capacidad máxima sin peligro de inundar la correa. El diseño especial de los puntos de traslado asegura un mínimo de derrames y una carga bien centrada.

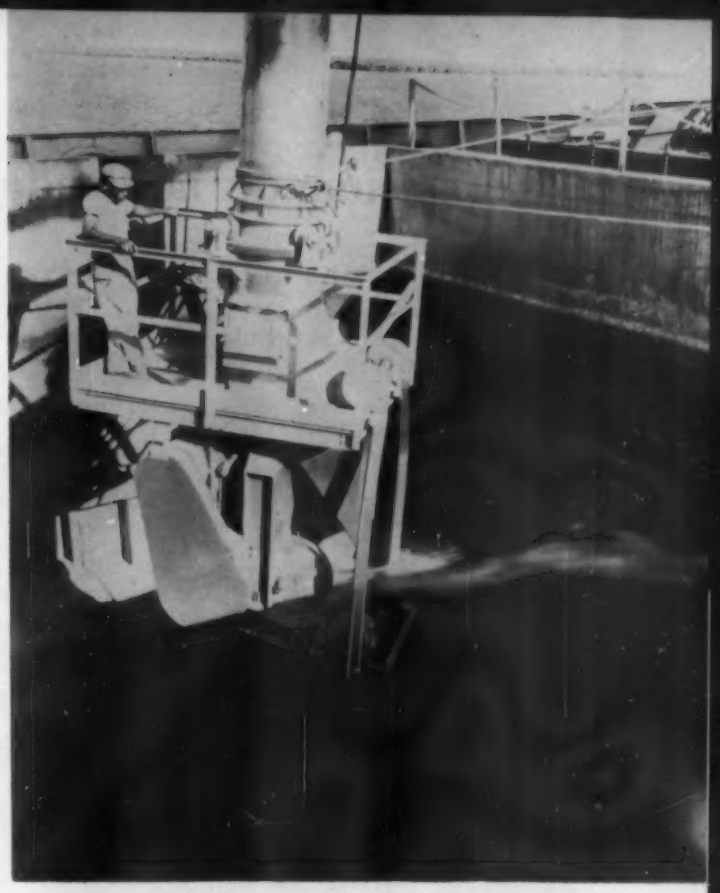
El sistema de pesar por tandas brinda una exactitud extrema y de confianza e incorpora básculas del tipo de tolva originalmente creadas para la instalación de Aguadilla y que han tenido gran éxito allí. Las compuertas de tolva hidráulicamente accionadas, también se diseñaron especialmente para sistemas de alta capacidad.

El transportador de botalón articulado—que puede subirse y bajarse para acomodarse a las condiciones de altura del barco en el agua—proporciona un máximo de flexibilidad para acomodar los diversos tipos de barcos que se espera llegarán al puerto. En la posición abatida el botalón se cierra en una cuna o lecho especial que alivia la carga sobre la maquinaria de izamiento y giro.

El arrumador de barcos en el extremo inferior de la canaleta telescópica pone de relieve el principio de lanzamiento que introdujo la Stephens-Adamson Mfg. Co. El azúcar cae a través de la boca sobre una correa de caucho sin fin que trabaja a una velocidad elevada sobre poleas y discos locos. En la corta distancia que el material recorre sobre la correa, ésta dirige el caudal de azúcar a los rincones más apartados de la bodega, asegurando una carga bien arrumada y pareja. Debido al hecho que el azúcar crudo no produce virtualmente ningún polvo, fué posible ubicar la plataforma del operador en el propio arrumador, permitiéndole ejercer control sobre la operación desde muy corta distancia.

La estación de botones eléctricos para el malacate de la canaleta telescópica está situado en esta plataforma. En control de la articulación es manual, verificándose por medio de una palanca de rueda dentada y un juego de engranajes y piñón. La trayectoria se controla manualmente empleando un volante de mano. Otras características de la canaleta y arrumador nicluyen: canaleta de acero inoxidable, cuerpo del arrumador de acero "Corten", engranajes y piñón de giro de bronce, autoalineación de la correa para mejorar su orientación, y correa sin fin fácilmente dismontable.

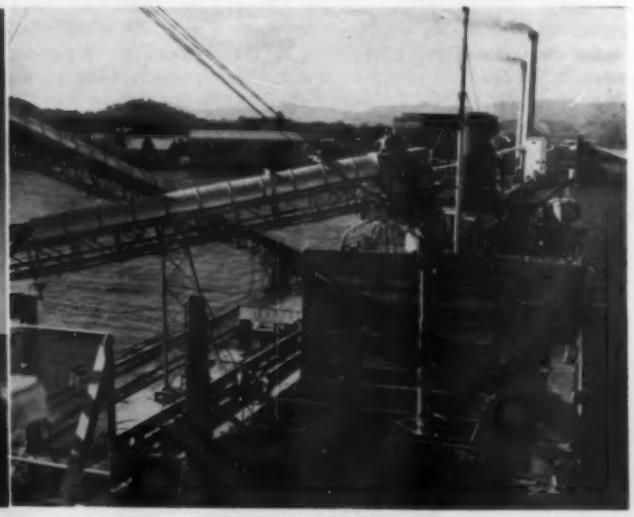
La instalación utiliza equipo Stephens-Adamson por toda su extensión, inclusive rolletes de apoyo, retenedores, limpiadores de correas, y la nueva polea Curve Crown de Stephens-Adamson. Esta polea proporciona un efecto orientador mayor de la correa con un mínimo de desgaste.



A la derecha; Al pie del canalón plegable, un regulador de carga Stephens-Adamson, cuyo funcionamiento se basa en el principio centrífuga dirige eficientemente el flujo del azúcar crudo a todos los rincones de la bodega.

Abajo, a la izquierda; El transportador cubierto trae el azúcar al costado del barco, que puede ser cargado en menos de 24 horas, comparado con los tres o cuatro días que antes llevaba dicha operación.

Abajo, a la derecha; El botalón de 60 pies de largo gira hasta quedar sobre las escotillas de carga del barco por las cuales es bajada un canalón plegable. El botalón se gira por un arco de 70 grados; el canalón puede ser alzado o bajado según los distintos tipos de barcos azucareros.



Expansión de la Producción Azucarera en Bolivia

La producción de azúcar en Bolivia en condiciones primitivas data de la inauguración de la República, pero no fue hasta el año 1940, más o menos, que la producción de azúcar comenzó en algo así como escala industrial. El primer ingenio que se construyó fue La Esperanza, seguido por La Bélgica, y luego San Aurelio y el Nueva Moka, que aún no está terminado. Todos estos ingenios están en la provincia de Santa Cruz y todos se encuentran bajo la administración de empresas privadas. Entonces, en 1956, el Gobierno intervino, construyendo el ingenio Guabirá, el central azucarero más grande del país.

Durante ese año, la producción conjunta de esos cuatro ingenios fue como sigue:

	Toneladas cortas
Guabirá	**5,660**
La Bélgica	**2,860**
La Esperanza	**1,140**
San Aurelio	**685**
Total	**10,345**

Durante ese mismo año se importaba azúcar a razón de 47,400 toneladas cortas al año. Para 1958, la producción nacional se había aumentado a 16,700 toneladas cortas, o sea un aumento de 61.25%. Las cifras oficiales para la cosecha de 1959 aún no están disponibles, pero se calcula la producción en 26,000 toneladas, cuyo aumento se debe a mejoras llevadas a cabo en Guabirá y La Bélgica.

La caña utilizada para producir esta cantidad de azúcar procede de unos 13,580 acres. El rendimiento promedio por acre de la caña es de unas 16.5 toneladas; el rendimiento de azúcar por ciento caña oscila entre un 8% en Guabirá a un 6% en La Esperanza.

El azúcar se importa actualmente a razón de 38,800 toneladas cortas al año; la producción nacional en 1959 se calcula en 26,-210 toneladas, de manera que el consumo total asciende a 65,000 toneladas. Por lo tanto, la industria nacional suministra sólo el 40.42% de las necesidades internas. El consumo per capita es de 35 libras al año.

La causa principal de este retraso en la industria nacional es que, hasta el año 1958, los precios que se pagaban por la caña en los ingenios eran arbitrarios, y, por consiguiente, los precios de costo y venta de los azúcareres nacionales no tenían relación alguna con los precios de costo y venta del azúcar importado. Mientras este último se vende a razón de 700,000 bolivares por tonelada métrica, el precio de la caña en el ingenio no es más de 430,000 bolivares. Bajo estas condiciones, el valor de la materia prima es sólo el 34% del valor del producto final.

Esta situación hizo crisis en 1958, cuando los agricultores amenazaron con abandonar el cultivo de la caña, e hicieron varias cosas para exteriorizar su descontento. Este fermento agrícola impulsó al Gobierno a actuar; las partes interesadas fueron convocadas a una conferencia de mesa redonda para discutir y resolver la disputa. Un nuevo precio provincial de la caña fue convenido para la cosecha del año 1958, cuyo precio será pagado hasta que la cuestión haya sido resuelta definitivamente por una Comisión Nacional para el Estudio de la Caña y el Azúcar (CNECA). La primera medida que adoptó la CNECA fue la de traer a especialistas extranjeros en tecnología azucarera para que ayuden a preparar un programa nacional.

De acuerdo con el nuevo plan, el Ministerio de la Economía Nacional ha creado nuevos impuestos sobre el azúcar importado y otros medios de subvencionar las fábricas para que puedan pagar un precio mejor por la caña. Se ha ampliado la extensión de terrenos dedicados al cultivo de la caña como resultado del nuevo precio de la caña y de las mejores técnicas agrícolas introducidas bajo la dirección de los expertos extranjeros, y se hace un esfuerzo por estimular el cultivo de la caña mediante el mejoramiento de los caminos para facilitar el transporte de caña a los ingenios.

Se llevan a cabo estudios preliminares con el propósito de construir varios ingenios nuevos. Cuando estos nuevos proyectos se convierten en realidad, dentro de tres o cuatro años, el país debería estar en condiciones de descontinuar completamente las importaciones de azúcar.

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Puerto Rico Obtiene una Nueva y Maravillosa Variedad de Caña

La Estación Experimental Agrícola de la Universidad de Puerto Rico ha obtenido una nueva variedad de caña, P.R 1013, y resulta que produce grandes rendimientos de azúcar. En todas las pruebas comparativas ha probado ser superior a las variedades comerciales que se cultivan actualmente en la Isla. Por ejemplo, en la región norte ha rendido 11.4%, en la costa sur, 42.7%, y en la costa este 28% más azúcar que el M.366, la variedad que es actualmente la más productiva, habiendo superado en un 44.8% por ciento el rendimiento de la POJ 2878. En una siembre grancultura en la costa sur, rindió un 60% más azúcar que la B. 37161; en una siembra de "primavera" rindió un 67% más azúcar que la POJ 2878. En una siembra grancultura con regadío, en la costa sur de la Isla, la nueva variedad ha rendido hasta 100 tonelades de caña por acre, con un promedio de 13.4% de azúcar.

Esta variedad es un cruce entre Co. 281 y POJ 2878. En más dulce y tiene tallos más gruesos que su hermana, la variedad de caña P.R. 980. Las sequías retardan su crecimiento, aunque se recobra rápidamente bajo condiciones climáticas normales, y además es muy resistente a las principales enfermedades de la caña.

Se espera que la nueva variedad mejore grandemente la situación de la industria azucarera de la Isla, que en recientes años ha dejado de producir su cuota en el mercado, y tanto la Estación Experimental como la Autoridad de Tierras están preparando su rápida distribución entre los cosecheros.

■

Imperial Sugar Tendrá Casa de Control de Calidad

En la refinería de la Imperial Sugar Company, en Sugar Land, Texas, se construye actualmente, a un costo de $500,-000, una "casa de control de calidad" ultramoderna, de seis pisos. Este nuevo edificio aumentará la capacidad de granulación y secado de azúcar blanco de dicha refinería en un 50%, y contendrá uno de los sistemas más completos y modernos de elaboración de azúcar moreno que existe en los Estados Unidos. El equipo de la nueva unidad asegurará mayor capacidad y mantendrá y mejorará de manera uniforme la apariencia de brillo del azúcar granulado. También habrá allí un sistema automático completamente nuevo para la elaboración, almacenamiento, manejo y embalaje de los tres tipos de azúcar moreno, o sea el claro, el mediano y el escuro. La zona de almacenaje del azúcar moreno en el nuevo edificio, situado junto al muelle de carga, aumentará las facilidades de embarque.

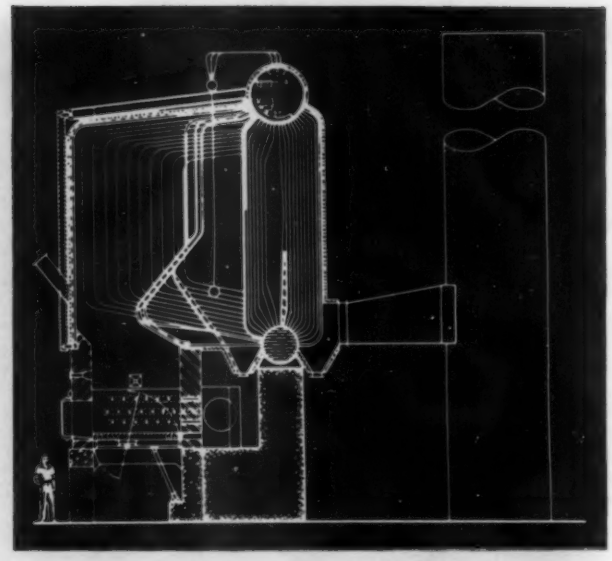
■

Nuevo Director Científico de la Sugar Research Foundation, Inc.

El Dr. John L. Hickson ha sido elegido Vicepresidente y Director Científico de la Sugar Research Foundation, Inc. El Dr. Hickson sucede al Dr. Henry B. Haas, quien renunció, pero seguirá colaborando en calidad de consultor de la Foundation. El Dr. Hickson es también presidente de la Sección de Carbohidratos de la American Chemical Society, Presidente del Capítulo Neoyorquino del American Institute of Chemists y miembro del Institute of Food Technologists.

GEORGE FLETCHER & CO LTD TALLERES MASSON LITCHURCH LANE DERBY INGLATERRA

Ahora, la mejor caldera para quemar bagazo es todavía mejor



Caldera Sterling de Dos Colectores y Baja-Pérdida-por-Tiro, provista de Hogar Ward para quemar bagazo.

Lea estos datos referentes a una caldera moderna, mejorada, diseñada por la B&W expresamente para quemar bagazo

La Caldera B&W Sterling de Dos Colectores y Baja-Pérdida-por-Tiro *no* es meramente otra caldera industrial para quemar bagazo. Es una unidad generadora de vapor compacta, diseñada expresamente para quemar bagazo en el Hogar Ward mejorado.

La B&W se valió de sus 83 años de experiencia en el diseño y construcción de calderas para la industria azucarera para hacer una buena caldera todavía mejor. Ahora, se han incorporado todas las mejores características de la primera unidad de baja-pérdida-por-tiro, diseñada por la B&W en 1946, *más* las mejoras en diseño. Más aún, usted ahorra en el costo inicial de la caldera y de la planta.

He aquí lo qué esta caldera mejorada le ofrece . . .

1. Funcionamiento continuo y seguro

● Reacción *instantánea* a grandes oscilaciones de carga. Esta unidad puede variar de 25 a 100 por ciento de capacidad en el tiempo que se necesita para aumentar la velocidad del soplador.

● El fondo basculante permite quemar bagazo continuamente durante *toda* la campaña—sin parar para limpiezas.

● Se puede quemar combustible de diverso contenido de ceniza y suciedad con el mínimo de escoria. Las paredes enfriadas por aire y la bóveda enfriada por agua de las celdas Ward reducen la formación de escoria—no hay parrillas en que se pueda formar escoria.

2. Funcionamiento económico

● El empleo de celdas Ward provee una reserva en la capacidad de encendido *sin tener que quemar combustible* auxiliar. Quema bagazo de muchos grados de grosor sin cambio en capacidad. No hay que regular el lecho de combustible.

● Las exigencias mínimas de fuerza auxiliar permiten un alto flujo neto de vapor. El vapor generado se utiliza para *producir,* y no para mover el equipo auxiliar de la caldera.

3. Menor inversión de capital

● El costo de la caldera y de la planta es más bajo, por libra de vapor.

● *No* se necesita soplador de tiro inducido.

4. Mínima atención y mínima conservación

● El hogar no tiene piezas movibles.

● La presión del vapor se controla por un regulador de tiro—fácilmente ajustado por el operador.

● Los paros durante períodos de inactividad se simplifican. El recalentador drenable simplifica los paros, a la vez que protege los tubos contra la corrosión.

● Encendido más rápido y seguro después de los paros. No hay que limpiar el recalentador—ya que se puede drenar antes de encender la caldera.

En una palabra, la Caldera B&W Sterling de Dos Colectores y Baja-Pérdida-por-Tiro está diseñada para reducir los costos de producción por la reducción de los costos de generación de vapor en centrales azucareros. Para más información sobre ésta y otras calderas encendidas con bagazo, sírvase comunicarse con el representante de la B&W más cercano, o escriba a The Babcock & Wilcox Company, Departamento de Exportación, 161 East 42nd Street, New York 17, N.Y., E.U.A.

E-89

B&W THE BABCOCK & WILCOX COMPANY

DEPARTAMENTO DE EXPORTACIÓN

Unidades portátiles o estacionarias para bombas de agua.

LA IRRIGACION

... aumenta las cosechas

la potencia CATERPILLAR *da mejores resultados*

Usted siente gran satisfacción cuando su bomba para irrigación desaloja suficiente cantidad de agua para sus cosechas. También gusta de dejar su bomba operando por si sola, protegida solamente por sus accesorios de seguridad. Pero su regocijo es aún mayor cuando revisa sus costos de operación y mantenimiento, y comprueba que obtiene mucha potencia a bajo costo.

Su confianza en los Motores Diesel Caterpillar es recompensada a través de una operación continua sin necesitar hacer más que el servicio rutinario. Los Distribuidores Caterpillar respaldan la venta de su equipo con un personal experimentado que utiliza repuestos legítimos Cat.

En su línea de motores usted encontrará unidades que desarrollan hasta 650 HP. También hay disponibles motores que operan con gas natural o con combustible diesel. ¡Solicite detalles completos al Distribuidor Caterpillar más cercano!

Caterpillar y Cat son Marcas Registradas de Caterpillar Tractor Co.

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Caterpillar of Australia Pty. Ltd., Melbourne • Caterpillar Brasil S.A., São Paulo • Caterpillar Tractor Co. Ltd., Glasgow • Caterpillar of Canada Ltd., Toronto

NORIT SUPRA

para azúcar refinado

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NORIT

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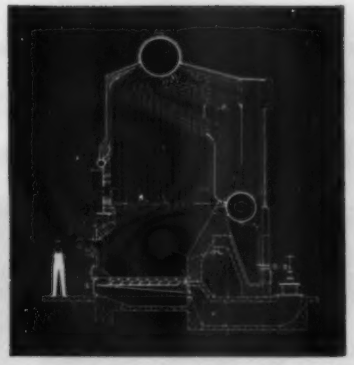
Vapor

PARA LA INDUSTRIA AZUCARERA

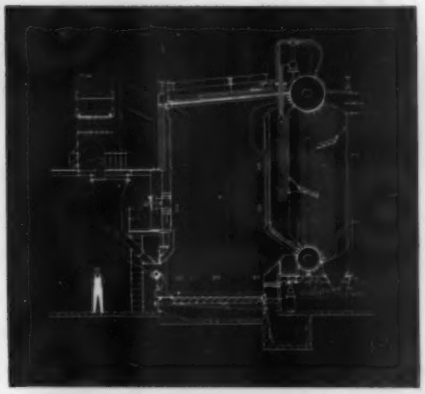
La Combustion Engineering ofrece a los centrales azucareros un renglón completo de equipo generador de vapor provisto de stokers diseñados especialmente para quemar bagazo mejor que por ningún otro método.

Ingenios azucareros del mundo entero han comprado estas calderas cuya capacidad total es de más de 3.630.000 kg de vapor por hora.

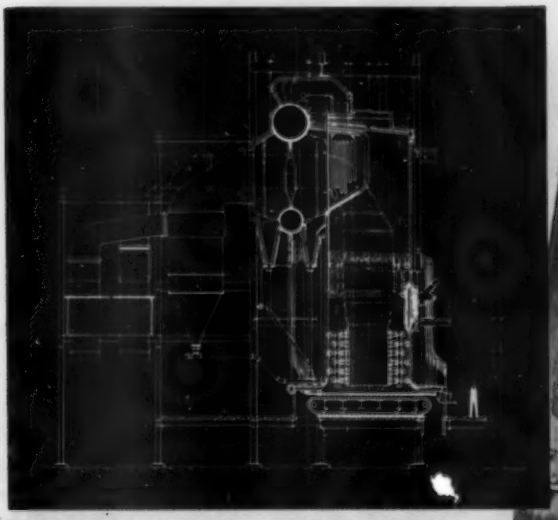
Por lo tanto cuando necesite esta clase de equipo, pídalo a la C-E, la compañía con vasta experiencia en esta industria. Consulta con nuestros representantes locales, o escriba directamente al Departamento de Exportación en la ciudad de Nueva York.



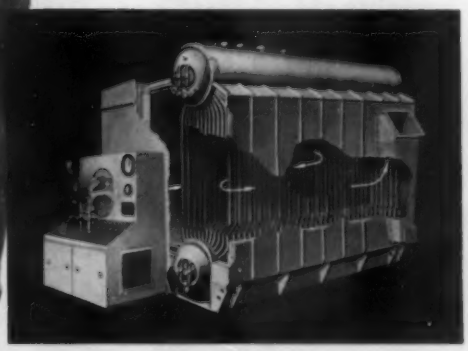
Caldera Vertical Integrada C-E Tipo VU-10 provista de stoker C-E para quemar bagazo (tipo de parilla de descarga). Este tipo de caldera es adecuado para hasta 20.000 kg de vapor por hora.



Caldera Vertical Integrada C-E Tipo VU-50 provista con stoker C-E para quemar bagazo (tipo de parrilla de descarga). Este diseño se recomienda para requisitos de hasta 57.000 kg de vapor por hora.



Caldera Vertical Integrada C-E Tipo VU-40 provista de stokers elevados C-E para bagazo, con parrilla corrediza de descarga continua; quemadores de petróleo auxiliares tangentes y toma de aire tangencial también se emplean. Es especialmente adecuada para abastecimiento de vapor a más de 57.000 kg de vapor por hora.



Caldera Integrada C-E Tipo VP para gas o petróleo. Especialmente buena para uso como equipo auxiliar y entre zafras. Es una caldera completa, compacta, armada en la fábrica; de instalación, operación y conservación sencilla y económica.

Afiliadas, concesionarios y representantes en todo el mundo libre

COMBUSTION ENGINEERING

C-E

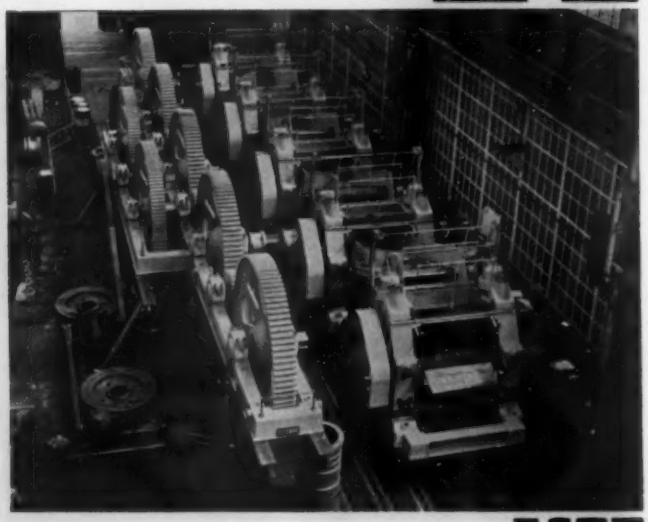
B-977A

Combustion Engineering Building • [illegible] Madison Avenue, New York 16, N.Y., E.U.A.

Grupos generadores de vapor; reactores nucleares; equipo para fábricas de papel; [illegible]adores; sistemas de secado instantáneo; receptáculos a presión; tubería de desagüe

Baudouin

Fábricas completas desde la caña hasta el azúcar



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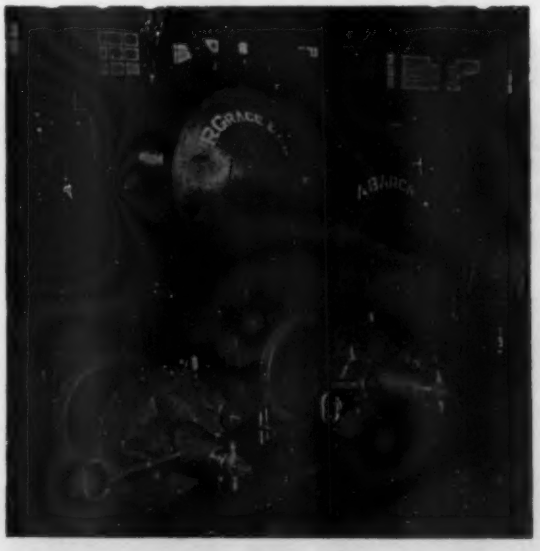

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Mazas para Trapiches
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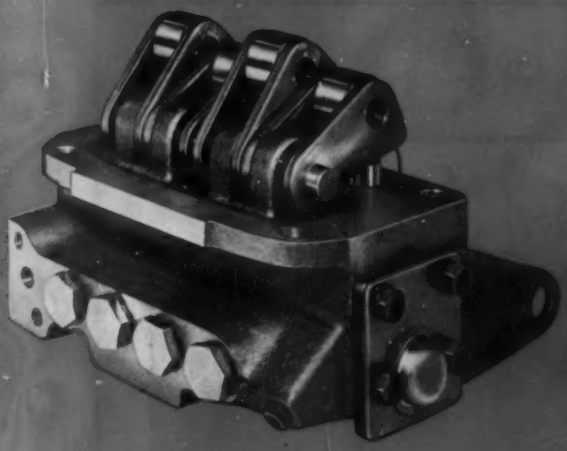


Bomba hidráulica Allis-Chalmers.

Ahorre dinero y combustible

En los tractores Allis-Chalmers se substituye peso con fuerza hidráulica

El método acostumbrado de poner más peso al construir el tractor o de añadirlo posteriormente en forma de pesas en sus ruedas para obtener tracción adecuada, presenta tres desventajas, que son:

1. Se aumenta el costo del tractor.
2. Se aumenta el consumo del combustible.
3. Se aumenta la compactación del suelo que resulta perjudicial.

Los tractores Allis-Chalmers no tienen peso muerto excesivo. Sin embargo, producen la tracción necesaria sin tal peso.

Por ejemplo, el tractor diesel Modelo D-17, aunque sólo pesa 2415 kilos, puede efectuar tantas labores pesadas como un tractor cuyo peso sea de 3400 kilos. Sin embargo, el D-17 cuesta menos y su funcionamiento es más económico que el de tractores mucho más pesados, y ejecuta tanto o más trabajo por hora, con menos compactación del suelo.

Estas ventajas se han podido conseguir gracias al superior sistema hidráulico que se utiliza en los tractores Allis-Chalmers, el cual automáticamente transfiere el peso del implemento a las ruedas motrices del tractor, según sea necesario y nada más que lo necesario para obtener le tracción debida. Cuando ya no se lo necesita, el peso se quita automáticamente. En trabajos livianos, se consume menos combustible porque el tractor no acarrea peso excesivo.

* * *

El Modelo D-17 diesel con una rastra de discos Modelo K preparando el terreno para la siembra. Su sistema de tracción hidráulico le permite hacer tanto trabajo como otros tractores más grandes y más pesados, a menos costo.

Para obtener información completa, consulte al Distribuidor de Maquinaria Agrícola Allis-Chalmers en su región, o escríbanos directamente.

ALLIS-CHALMERS INTERNATIONAL, Departamento AZ760, Milwaukee 1, E.U.A.

ALLIS-CHALMERS

FABRICANTES DE MAQUINARIA DESDE 1847

Las figuras que adornan el cochinito representan algunas de las formas de las sílices diatomáceas que se combinan para hacer de *Celite* una ayuda de filtro eficaz

Cómo las refinerías de azúcar ahorran *un saco* de sílice diatomácea en cada 7 con polvos de filtro CELITE*

Es fácil entender por qué las mejores refinerías confían en diatomita *Celite* para producir un gran volumen de azúcar diáfana más económicamente.

Los registros de producción muestran que *Celite* es la más económica de las ayudas de filtro: ¡6 sacos realizan el trabajo de 7 de otros *tipos* de tierra infusoria! El secreto estriba en la poca densidad aparente que hay en *Celite*. En un peso determinado, *Celite* ofrece *mayor* ayuda de filtro, al cubrir un área *mayor* de filtración.

Y lo que es más importante, con *Celite*, Ud. puede lograr una purificación de cal de P_2O_5, decolorar y clarificar, en una sola operación. Ud. gasta mucho menos en carbón vegetal como decolorante, y obtiene un índice de flujo más rápido y mayor claridad. Además, habrá resuelto el problema de las bacterias termófilas.

Es muy fácil para Ud. utilizar *Celite*, porque puede seguir usando los mismos filtros y tanques mezcladores. Hay una extensa gradación, para que Ud. elija, de acuerdo con los requisitos de flujo y claridad de su refinería. Y recuerde que todos los pedidos serán de calidad uniforme, porque J-M mantiene, saco a saco, un control de su producción de *Celite*. Pida Ud. datos más concretos sobre los polvos de filtro *Celite* a Johns-Manville International Corporation, Box 60, New York, N. Y., EE.UU.

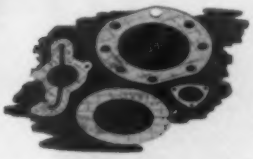
*Celite es marca registrada por Johns-Manville en muchos países, para sus productos de sílice diatomácea.

JOHNS-MANVILLE JOHNS-MANVILLE JM PRODUCTS

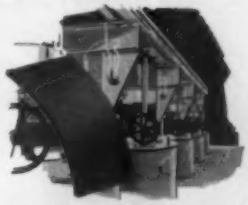
El distribuidor J-M local le dará detalles sobre las ayudas J-M para la industria azucarera . . .

Techados protegidos al máximo . . . desde azoteas horizontales hasta declives de 50 cm. por metro. J-M ofrece los techados de amianto, ya listos, Aquadam* y Flextone*.

Aislamientos para tuberías calentadas de 40° a 650°C. *Thermobestos** J-M es a prueba de corrosión, para muchas aplicaciones al aire libre. Es liviano, resistente y no se pudre.



Obturación rápida y confiable con empaquetaduras en Lámina *Service* J-M, Estilo 60: un material para obturación a toda prueba, contra vapor, gas, agua, aceites y substancias químicas. Dura mucho.



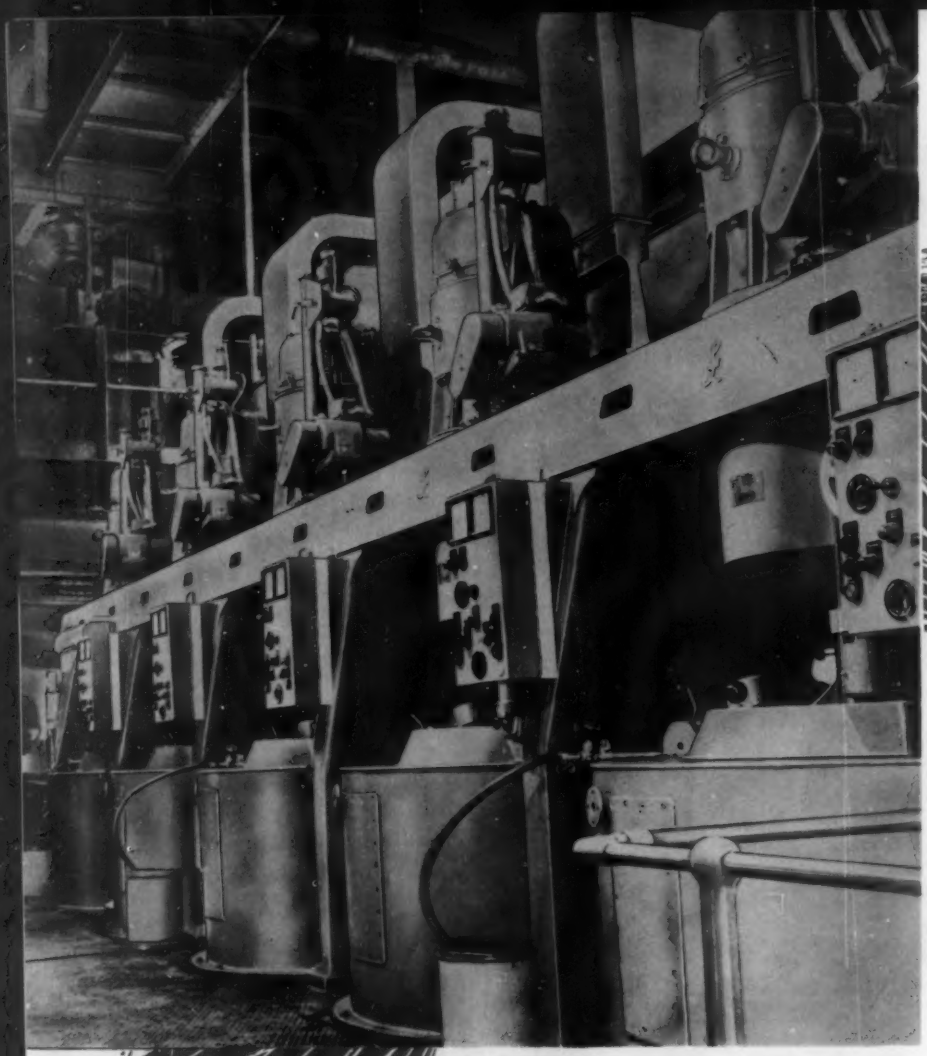
Para frenaje seguro de maquinarias centrífugas y de rotación en general, especifique los Materiales de Fricción de confianza: Johns-Manville.

*Marcas registradas

Johns-Manville
Box 60, New York 16, N.Y., EE.UU.
Sírvanse enviarme información acerca de:

- ☐ Polvos Celite
- ☐ Techados listos para colocar J-M
- ☐ Aislamientos Thermobestos
- ☐ Juntas y Empaquetaduras J-M
- ☐ Materiales Industriales de Fricción J-M

Nombre _____
Dirección _____
Compañía _____
Ciudad _____ País _____



Una batería 6 48"x30", 1,300 r/m, de centrífugas completamente automáticas con Transmisión Leonard en The Millaquin Sugar Co., Bundaberg, Australia.

En fábricas y refinerías de azúcar de remolacha y de caña siempre se observa la tendencia hacia la modificación del proceso de elaboración a fin de obtener cada vez mayor continuidad. Para llevar aún más lejos este principio, la ASEA-Landsverk presenta—

La Centrífuga Completamente Automática

con Transmisión Leonard

Esta centrífuga presenta las mismas ventajas que la máquina de marcha continua y velocidad constante, en lo que se refiere al bajo consumo de energía y al bajo costo de conservación.

SUS PRINCIPALES CARACTERISTICAS SON:

- **Diseño Aerodinámico**
- **Velocidades Variables, Máxima y de Carga**
- **Frenaje Regenerativo Completamente Eléctrico**
- **No Ocurren Picos de Carga**
- **Mecanismo de Carga Neumáticamente Accionado**
- **Descargador Accionado por Motor**
- **Sincronización Automática Centralizada**

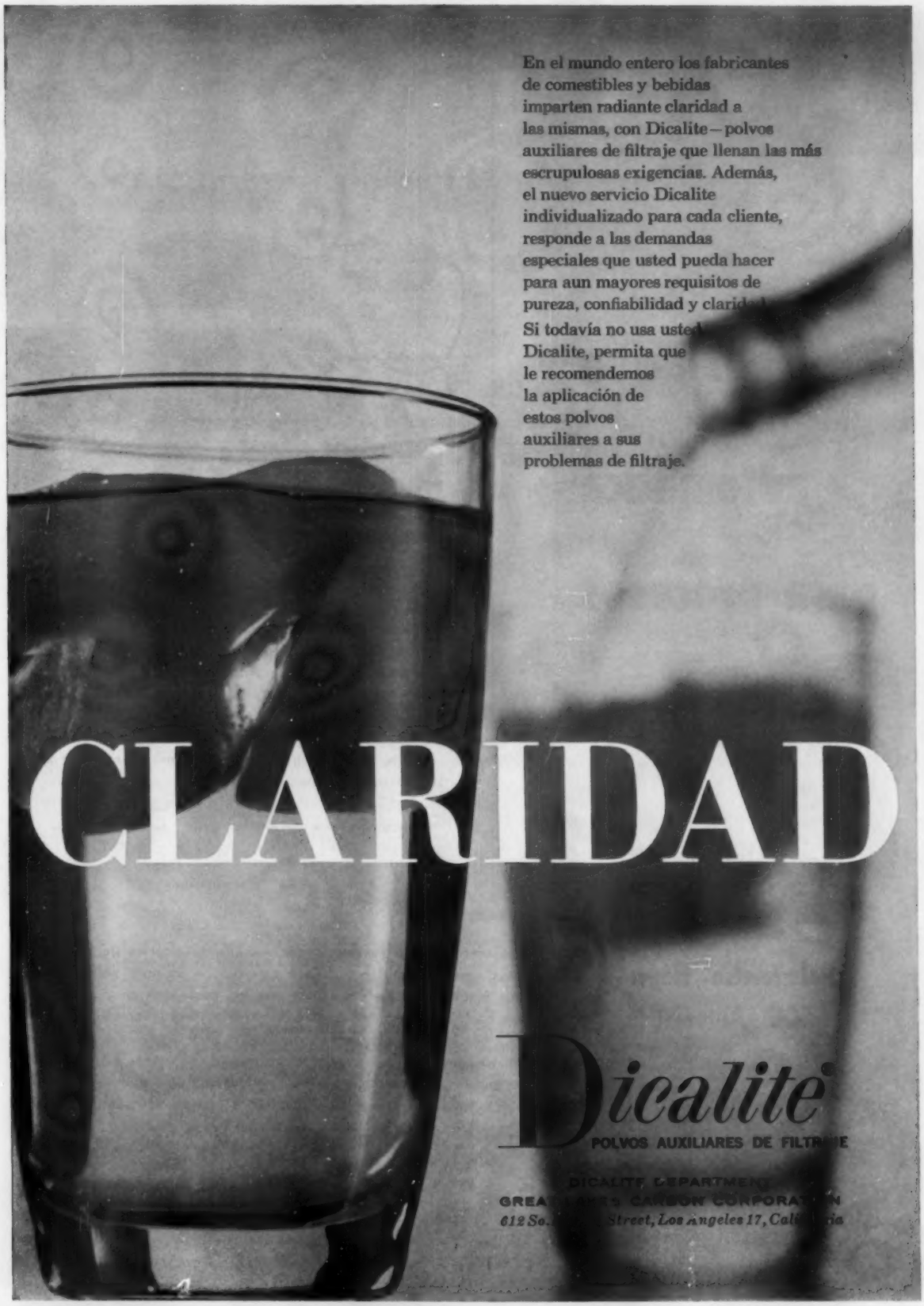
Propia para Azúcar de Todas Clases

Contamos con representantes y facilidades de servicio en casi todos los países productores de azúcar.

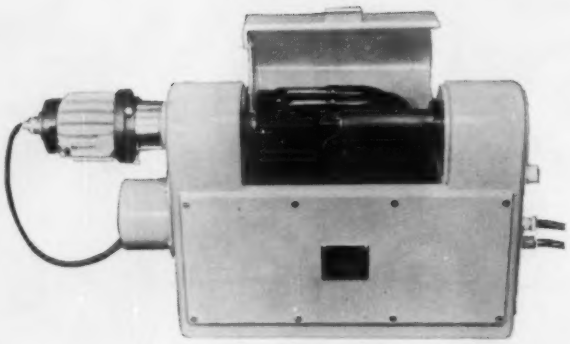
Para mayor información diríjanse a la oficina de la ASEA mas cercana, o directamente a:

ASEA

Västerås, Suecia


En el mundo entero los fabricantes de comestibles y bebidas imparten radiante claridad a las mismas, con Dicalite—polvos auxiliares de filtraje que llenan las más escrupulosas exigencias. Además, el nuevo servicio Dicalite individualizado para cada cliente, responde a las demandas especiales que usted pueda hacer para aun mayores requisitos de pureza, confiabilidad y claridad.
Si todavía no usa usted Dicalite, permita que le recomendemos la aplicación de estos polvos auxiliares a sus problemas de filtraje.
CLARIDAD
Dicalite
POLVOS AUXILIARES DE FILTRAJE
DICALITE DEPARTMENT
GREAT LAKES CARBON CORPORATION
612 So. Street, Los Angeles 17, California

Regulación automática para procesos



Refractómetro Hilger de Flujo Continuo

El refractómetro de flujo continuo hace una comparación continua entre una muestra de flujo y un líquido de referencia. Se puede usar para medir la concentración y comprobar la pureza de cualquier flúido transparente. El instrumento es completamente automático, e indica inmediatamente cualquier variación en el índice de refracción de la muestra. Las lecturas de este refractómetro también se pueden usar para hacer un registro permanente de la concentración, o para establecer un sistema de regulación para devolver la concentración a su nivel correcto. Ilustrado arriba.

Polarímetro Hilger M 500 Automático

El polarímetro M 500 se emplea para análisis rutinarios de azúcar, productos químicos, aceites, bebidas gaseosas, o en una palabra, para cualquier líquido ópticamente activo. Se usa para fines de aviso continuo y comprobación a intervalos de tiempo, o para tomar muestras de templas. Las lecturas, que pueden ser en grados de sacarosa o grados de arco, son dadas en cifras, y pueden ser indicadas, registradas o impresas. El instrumento da lecturas hasta 0.05° S, aunque su exactitud funcional es todavía más precisa, y sus límites abarcan cualquier intervalo de 14° en la escala de sacarosa Ilustrado en la página 24.

Solicite datos completos.

HILGER & WATTS

HILGER & WATTS LTD • 98 ST PANCRAS WAY • LONDRES, NW1 • INGLATERRA • GULliver 5636

HILGER & WATTS LTD. DORTMUNDE HURDE. ALEMANIA HILGER & WATTS INC., CHICAGO 5, E.U.A.

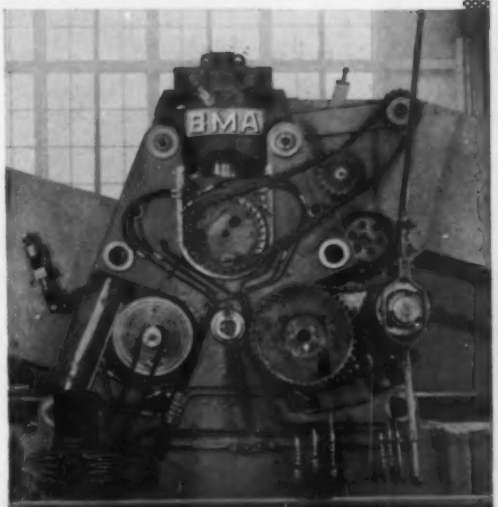
BMA

Los molinos de caña

son de construcción moderna y resistente, cuyos resultados han sido sumamente satisfactorios en la industria de azúcar de caña.

Especialidades del molino BMA de chumaceras simples:

- **Las nuevas armazones triangulares engoznadas permiten altas cargas en la maza superior**
- **Cambio rápido de las mazas, levantando la culata hidráulica o las tapas laterales**
- **Chumaceras sumamente adjustadas que aseguran perfecto funcionamiento**
- **Lubricación central para todos los molinos**



El molino de cojinetes de rodillos, con transmisión de 3 ejes diseñada por la BMA, también ha dado buenos resultados debido a la sencillez de los métodos de conservación.

Estas plantas de molienda modernas han sido suministradas a la América Central y América del Sur, así como a Asia Meridional. Solamente en el curso de los últimos tres años, hemos montado 8 fábricas de azúcar de caña completas en la India.

BRAUNSCHWEIGISCHE MASCHINENBAUANSTALT

BRAUNSCHWEIG · ALEMANIA OCCIDENTAL

Fábricas completas desde más de 100 años para:

Azúcar de remolacha y azúcar de caña, así como para fábricas de alcohol, levadura, almidón, substancias para curtidos y aceites vegetale

Extractos de Publicaciones Azucareras

Publicados bajos los Auspicios de la
Sociedad Internacional de Tecnólogos Azucareros de Caña
por Arreglo Especial con
SUGAR y AZUCAR—Dr. O. W. Willcox, Redactor Técnico

Agronomía

Ensayos de Abonamiento con Nitrógeno en Cañaverales

Informe, Hawaiian Sugar Experiment Station, 1958

Una serie de ensayos de abonamiento con nitrógeno indicó que las grandes variaciones en la fecha de aplicación surten escaso efecto en los rendimientos. Todo el nitrógeno pudo ser aplicado al cabo de un mes después de la siembra, y los rendimientos fueron iguales o excedieron los de parcelas que recibieron pequeñas aplicaciones de nitrógeno retardadas. Los datos recogidos indican que las aplicaciones de nitrógeno parciales a la cosecha ejercen escaso efecto sobre el contenido de nitrógeno en los retoños. En otras palabras, las aplicaciones de nitrógeno tardías producen escasa diferencia en la velocidad de desarrollo y en el contenido de nitrógeno en las hojas de brotes subsiguientes a tales aplicaciones.

■

Uso de Superfosfato en la Clarificación de Jugos de Caña

J. M. SAHA, D. L. N. RAO y VIRENDRA SINGH, *Memoria,* Sugar Cane Technologists, India, Vol. 26, Parte II, págs. 125-134 (1958)

Partiendo de un extenso experimento, se observó que el mejor método de preparar soluciones de fosfato para uso en la clarificación de jugos de caña por el sistema de sulfitación corriente es mezclar el fosfato sólido con condensado de fábrica caliente (60° C). El proceso de cochura reduce positivamente el contenido de P_2O_5, especialmente en triple superfosfato. En lo que al contenido de CaO en el jugo clarificado se refiere, no importa si el superfosfato se agrega en forma de pasta o en solución asentada. La pasta presenta cierta ventaja, por tanto que no implica trabajo adicional ni equipo mecánico para fines de filtración, etc. En el caso de superfosfato simple, la determinación rutinaria de P_2O_5 se puede hacer directamente por el método de oxalato. Para el triple superfosfato, el molibdato de amonio es más adecuado; los análisis por el método al jabón producen valores demasiado bajos.

■

Tecnología

Centrífuga de Flujo Continuo

F. SCHNEIDER, *Zucker, Vol. 12, No. 14, págs. 330-331 (1959)*

Durante los últimos dos años, varios tipos de "centrífugas de flujo" han sido diseñados y probados en fábricas de azúcar alemanas. La ilustración inserta demuestra el principio básico de estas máquinas. La masa cocida entra perpendicularmente y luego se eleva por los lados inclinados de un cedazo cónico de malla fina que gira alrededor de un eje vertical a gran velocidad y lanza el azúcar por el borde superior mientras que la miel final pasa por el cedazo y se acumula debajo. Dos compañías, la Hein, Lehmann & Co. y la BMA, han evolucionado tipos de esta máquina para masas cocidas intermedias y finales, que se dice dan muy buen resultado.

La ventaja de estas máquinas está en que el azúcar y la miel se separan continuamente y no hay curvas máximas de consumo de electricidad. Las capacidades son de 15 a 25 toneladas por hora de masas de bajo grado. Pueden manejar masas cocidas de la peor calidad y requieren muy poca limpieza con vapor o agua. Estas ventajas van acompañadas de ciertas desventajas; las pequeñísimas aberturas de la malla (0.06-0.09mm) tienden a agrandarse y a dar paso a mayor cantidad de granos finos, pero, por otra parte, no se pueden tupir con las peores masas cocidas. Sin embargo, se espera que la tendencia de las aberturas a agrandarse podrá ser corregida mediante modificaciones del diseño. Otra desventaja es que la gran fuerza centrífuga causa tal desgaste de los cristales que la afinación se hace más difícil.

■

Nueva Fórmula para la Extracción Reducida

B. L. MITTAL, *Memoria,* Sugar Cane Technologists, India, Vol. 26, Parte II, págs. 137-139 (1958)

Una comparación de distintos tándems que muelen cañas de diversos contenidos de fibra resulta nula a no ser que la influencia de la fibra sobre la extracción se elimine por completo o se reduzca teóricamente a un nivel común de fibra por ciento caña.. La fórmula de Noel Deerr para este fin es

$$e' = \frac{7 \cdot V}{7}$$

donde e' es la extracción reducida y V es el jugo perdido por unidad de fibra en la caña. Esta fórmula es aceptada por casi todos los tecnólogos en azúcar de caña. El nivel común del contenido de fibra aquí tomado es 12.5% caña.

La expresión para la V parece lógica, pero hay un error fundamental en su derivación. El valor de extracción e' se determina a base de la extracción de polarización y no de la extracción de jugo, y esto implica el supuesto que la caña consta de fibra y jugo de estructura homogénea solamente. Más, en ninguna parte satisface la caña esta condición ideal. El autor analiza el problema matemática y minuciosamente y llega a la fórmula,

$$e' = 1 - (0.125/f) \times P/_{bc} /P_c$$

donde f representa fibra por unidad de caña, P_{bc} la Pol en bagazo por unidad de caña, y P_c la Pol por unidad de caña. En esta fórmula se elimina por completo la influencia de la variación en fibra. En una tabla se demuestra que con la Pol por unidad de caña, Pol unidad de bagazo y fibra por unidad de bagazo permaneciendo inalteradas, la extracción reducida aumenta conforme a la fórmula de Deerr, pero que permanece constante conforme a la nueva fórmula, lo que equivale, por lo tanto, a una mejora positiva sobre la vieja fórmula.

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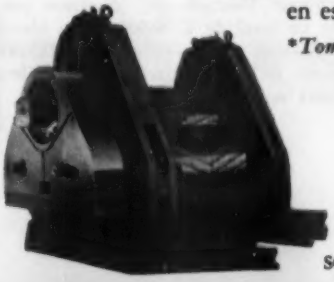

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SQUIER — los creadores del afamado Trapiche de Tensión Triangular.

Lodos del Filtro-Prensa

(*Vine de las páginas* 52)

Se pudiera preguntar si ofrece otras ventajas el "composting" mecánico de los lodos de los filtros-prensas de los ingenios que no sean la de economizar tiempo, y la respuesta es que ofrece muchas y la mayoría de ellas son más importantes que el factor de economía de tiempo. Por ejemplo, y como hemos dicho anteriormente, el método mecánico hace uso inmediato de los constituyentes del material para la evolución de las especies de microorganismos que más eficientemente estimulan el proceso de la degradación del material. Al rastrillar el material, perdemos estas ventajas y prolongamos el tiempo consumido, como también aumentamos el trabajo invertido en girar el material a intervalos repetidos. Una tercera ventaja consiste en que el material "composted" mecánicamente, a diferencia de el que actualmente se lleva a los campos y se aplica fresco, permanece inefectivo durante un largo período de tiempo y tiende inicialmente a deprimir la cantidad de nitrógeno disponible en el suelo. Además de todas estas ventajas, el traslado inmediato de los lodos húmedos de los filtros-prensas al "composter" cerrado elimine la molestia del olor del material, que bajo esas condiciones se descompone anaeróbicamente.

Pruebas llevada a cabo con material "composted" mecánicamente demuestran la bondad de este método. En la ilustración que se reproduce a continuación, ofrecemos fotografías de material "composted" mecanicamente en comparación con la que se descompone normalmente.

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Un Rendimiento de Caña Sin Precedentes

En un concurso de cultivación de caña en toda la India (1959), un cosechero del Estado de Andhra encabezó la lista de todos sus competidores con una producción de 4,000 libras, 168 toneladas, de caña propria para la molienda, con un acre de tierra. En la ceremonia para la presentación del premio, que se efectuó en New Delhi, el primer ministro Nehru manifestó, ante una nutrida concurrencia compuesta de agricultores, que sólo por los métodos gemelos de adoptar técnicas modernas y trabajar con ahinco podrían aumentar la producción agrícola del país.

■

Molino Modelo en la Exposición Británica

Un modelo de guía de un molino de caña que representa el último molino en un tandem impulsado por una turbina de vapor por medio de un engranaje reductor es una de las más interesantes presentaciones que ofrece la Exposición Británica, en el Coliseum de Nueva York. El modelo, exhibido por The Mirrlees Watson Company, de Scotland, incorpora el sistema de devolución del jugo no filtrado, de esa compañía, y su transportador intermedio de levante rápido y tanto los acumuladores de Edwards como de Munson. La misma casilla contiene también centrífugas automáticas y otros equipos para la fabricación, sin olvidar una fotografía de Río Turbio mill en Venezuela, construido por la Mirrlees Watson. La Exposición abrió el 10 de junio y permanerá abierta hasta el 26 de junio.

Nuevo Ingenio en Tanganyika

Un ingenio y refinería con una capacidad productiva inicial anual de azúcar refino de 20,000 toneladas será construido sobre las orillas del río Great Rusha en el Valle de Kilombero, en Tanganyika, Africa. La Kilombero Sugar Company ha adquirido una concesión de tierra fértil del Gobierno de Tanganyika y lleva a cabo el desmonte de 7,000 acres para la siembra de caña. Los planes abarcan un aumento en la capacidad productiva del ingenio y refinería hasta 30,000 toneladas al año, cuando el creciente consumo lo justifique. El consumo per cápita se encuentra ahora en el bajo nivel de 10 lbs. por año y todo el azúcar es importado. El nuevo ingenio estará funcionando para 1962. El costo total se calcula en £3,210,000, de cuya cantidad contribuirán £2,300,000 la International Finance Corporation, Colonial Development Corporation, Netherlands Overseas Finance Corporation and Vereenigde Klattensche Cultuur Maatschappij. Acciones por valor de un total de £700,000 serán ofrecidas a africanos y un crédito de £210,000 por parte de los abastecedores completará la suma necesaria.

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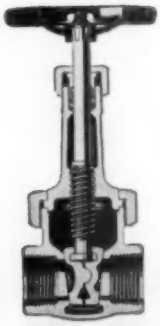

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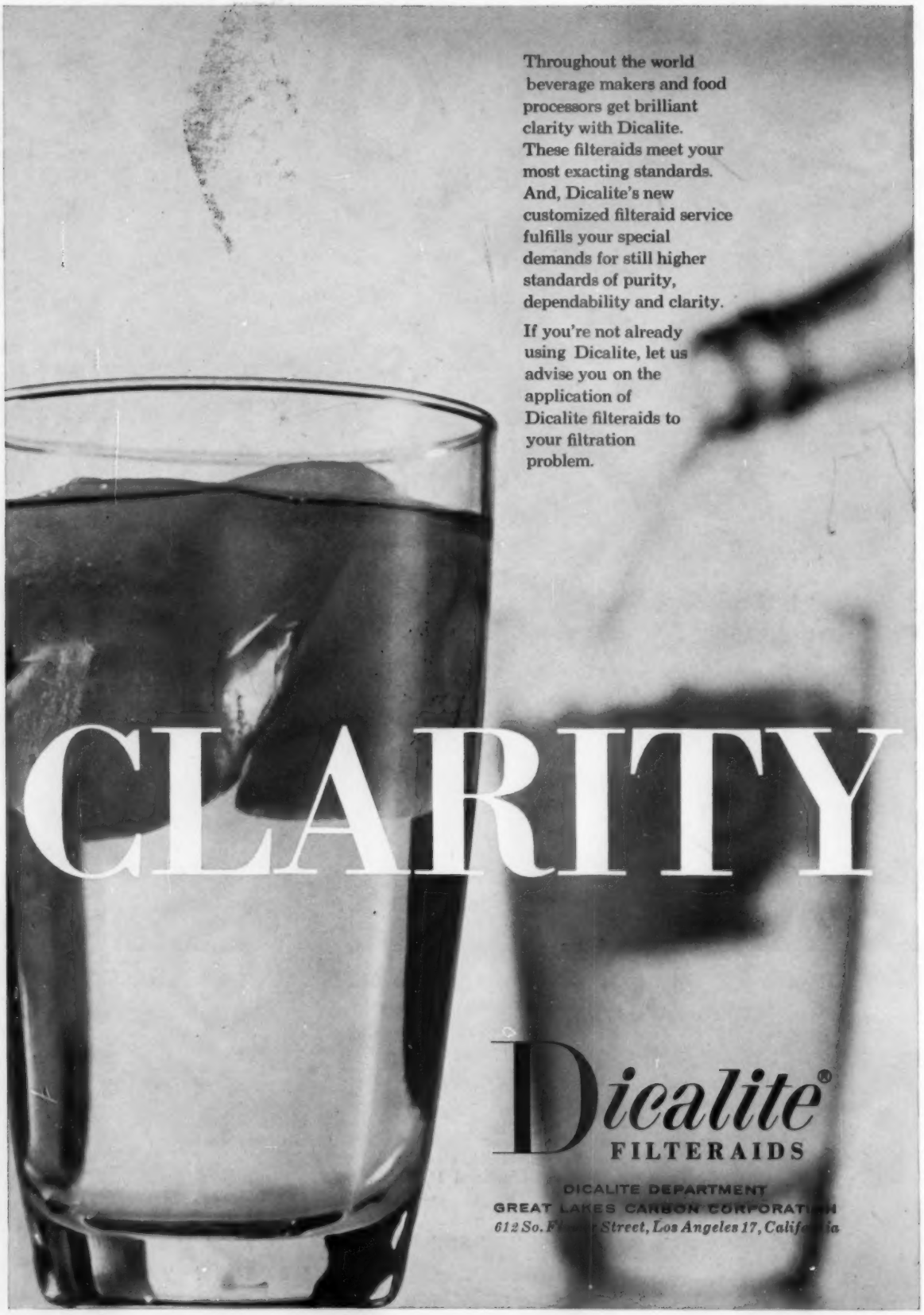
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